

For Macintosh Programmers & Developers

In This Issue!

# MacTech™

A G A Z I N E

• Vol. 12, No. 1 • January 1996

Special  
Internet  
Section

## INSIDE:

### GETTING STARTED

PowerPlant and Modeless Child Windows

### RABB'S APPLE

Tomorrow's Developers

### UNIFORM RESOURCE LOCATORS

### CUTTING EDGE TECHNOLOGIES

Opening the BeBox

### VMANTEC TOP 10

### INTERNET SOLUTIONS

Becoming a Macintosh Service Provider

### FROM THE FACTORY FLOOR

Java Talk

### AVATECH™

Java Rules

### INTERNET SPECIAL

Inside HomeDoor

### INTERNET DEVELOPMENT

CGI's: AppleScript or Frontier?

### BOOK REVIEW

New Apple Guide Authoring Aids

### NEW APPLE TECHNOLOGY

OpenDoc: Contain Yourself...

### PROGRAMMER'S CHALLENGE

Sliding Tiles

### AND MORE!



\$5.85 US  
\$6.95 Canada  
ISSN 1067-8360  
Printed in U.S.A.



# Want to unlock the power of PowerPC™ microprocessors? Here's the key.



If you want to crank out code that really screams on PowerPC microprocessor-based systems, then it helps to work with the experts who know the PowerPC Architecture™ inside and out—Motorola.

Motorola's Software Development Kits for Power Macintosh™ leverage our experience as one of the creators of the PowerPC Architecture. We know how to get the highest possible performance out of every

member of the PowerPC family, including the PowerPC 603™ and PowerPC 604™ microprocessors. And we build that expertise into our highly optimizing C/C++ and FORTAN compilers. They'll streamline your code, so your applications run cleaner and faster. And that can give them the edge in the marketplace.

And now, when you license a Motorola C/C++ or FORTAN SDK for only \$349,\*

you'll get the complete Apple® MPW environment, as well as free upgrades for a full year.

So contact Motorola for more information, or to order your own Macintosh® SDK. And unlock the power inside PowerPC microprocessors.

**Call 1-800-347-8384 or 1-512-891-2999.**

Internet: [ppcinfo@pets.sps.mot.com](mailto:ppcinfo@pets.sps.mot.com)  
WWW: <http://www.mot.com/PowerPC>  
Applelink: [motosoftware@applelink.apple.com](mailto:motosoftware@applelink.apple.com)  
\*Suggested list price in U.S. dollars. Subject to change.

**PowerPC™**



**MOTOROLA**

**Eddy Award Winner for Best New Developer Tool**  
— MacUser Editors Choice Awards, 1993

“A distinct improvement over ResEdit.”  
— MacTech/MacTutor

“Resorcerer’s data template system is amazing!”  
— Bill Goodman, author of Compact Pro

“Nuke ResEdit! Resorcerer is mission-critical for us.”  
— Dave Winer, Userland Frontier

“The color pixel editors are wonderful! A work of art!”  
— Dave Winzler, author of Microseeds Redux

“Every Macintosh developer should own a copy of Resorcerer.”  
— Leonard Rosenthal, Aladdin Systems

“Resorcerer will pay for itself many times over in saved time and effort.”  
— MacUser review

“The template that disassembles ‘PICT’s is awesome!”  
— Bill Steinberg, author of Pyro! and PBTools

“Resorcerer proved indispensable in its own creation!”  
— Doug McKenna, author of Resorcerer

“...a wealth of time-saving tools.”  
MacUser Review, Dec. 1992



# RESORCERER®

## Version 1.2.4

### ORDERING INFO

Needs: ≥Mac Plus, ≥ Sys 4.2, 1MB  
Likes: ≥Mac Plus, ≥ Sys 7.0, 2MB  
32-bit clean, AU/X compatible

Price: \$256 (decimal)  
(Educational, quantity, or  
other discounts available)

Includes: 500 page manual  
60-day Money-Back Guarantee  
Domestic UPS ground shipping

Payment: Check, PO's, or Visa/MC

Extras (call us):  
COD, FedEx, UPS Blue/Red,  
International Shipping

### Downloadable Demos/Updaters:

AppleLink: Software Sampler  
AOL: Software Libs/Development  
CompuServe: MACDEV/Tools  
or call us.

### The Resource Editor for the Macintosh Wizard

#### New 1.2 Features:

- New ‘eicn’, ‘ppat’, ‘crsr’, ‘acur’, ‘pltt’, ‘clut’ editors
- Powerful icon family editing (all 9 icon types)
- Color pixel anti-aliasing, dithering, and lots more
- Complete ‘PICT’ disassembly and reassembly
- Resource sorting; ROM resource browsing
- 120 template field parsing types now supported
- New insertion & deletion template field types
- Text-only ‘PICT’ resources
- Lots of improvements throughout

- Easier, faster, more Mac-like, and more productive than ResEdit
- Safer memory-based, not disk-file-based, design and operation
- All file information and common commands in one easy-to-use window
- Compares resource files, and even **edits your data forks** as well
- Visible, accumulating, editable scrap
- Searches and opens/marks/selects resources by text content
- Makes global resource ID or type changes easily and safely
- Builds resource files from simple Rez-like scripts
- Most editors DeRez directly to the clipboard
- All graphic editors support screen-copying or partial screen-copying
- Hot-linking Value Converter for editing 32 bits in a dozen formats
- Its own 32-bit List Mgr can open and edit very large data structures
- Templates can pre- and post-process any arbitrary data structure
- Includes nearly 200 templates for common system resources
- TMPLs for Installer, MacApp, QT, Help, AppleEvent, OCE, GX, etc.
- Full integrated support for editing color dialogs and menus
- Try out balloons, ‘ictb’s, lists and popups, even create C source code
- Integrated single-window Hex/Code Editor, with patching, searching
- Editors for cursors, versions, pictures, bundles, and lots more
- Well-designed, helpful developer tools being added all the time
- Relied on by thousands of Macintosh developers around the world

MATHEMÆSTHETICS, INC.

P.O. Box 298 • Boulder • CO • 80306-0298 • USA

Phone: (303) 440-0707 • Fax: (303) 440-0504

AppleLink/AmericaOnline: RESORCERER • Internet: resorcerer@aol.com

## THE STAFF

For Macintosh  
Programmers & Developers

MacTech™  
MAGAZINE

A publication of XPLAIN CORPORATION

# How To Communicate With Us

In this electronic age, the art of communication has become both easier and more complicated. Is it any surprise that we prefer **e-mail?** If you have any questions, feel free to call us at 805/494-9797 or fax us at 805/494-9798.

DEPARTMENTS	Internet	eWorld	CompuServe	AppletLink	America Online
Orders, Circulation, & Customer Service	custservice@mactech.com	MT.CustSvc	71333,1063	MT.CUSTSVC	MT.CUSTSVC
Editorial	editorial@mactech.com	MT.Editors	71333,1065	MT.EDITORIAL	MT.EDITORS
Programmer's Challenge	progchallenge@mactech.com	MT.PrgChal	71552,174	MT.PROGCHAL	MT.PRGCHAL
Ad Sales	adsales@mactech.com	MT.AdSales	71552,172	MT.ADSALES	MT.ADSALES
Online Support	online@mactech.com	MT.Online	-	-	-
Accounting	accounting@mactech.com	accounting@xplain.com	-	-	-
Marketing	marketing@mactech.com	MT.Mktg	-	-	-
Press Releases	pressreleases@mactech.com	pressreleases@xplain.com	-	-	-
General	info@mactech.com	info@xplain.com	71333,1064	MACTECHMAG	MacTechMag
Online support area	http://www.mactech.com	use shortcut: MACTECH	type see Third Parties: GO MACTECHMAG	Third Parties (H-O) MACTECHMAG	use keyword: MACTECHMAG

### XPLAIN CORPORATION

**Chief Executive Officer** • Neil Ticktin  
**Chief Financial Officer** • Andrea J. Sniderman  
**Advertising Executive** • Ruth Subrin  
**Customer Service** • Al Estrada  
**Art Director** • Judith Chaplin  
**Software Engineer** • Don Bresee  
**Accounting Assistant** • Brian Shin  
**Marketing Manager** • Jeffrey Mesnik  
**Network Administrator** • Donal Corcoran  
**Administrative Assistant** • Susan Pomrantz

**Board of Advisors** • Blake Park, Alan Carsrud, Jordan Mattson, Steven Geller



Printed on recycled paper.



### MacTech Magazine

MacTech Magazine is grateful to the following individuals who contribute on a regular basis. We encourage others to share the technology. We are dedicated to the distribution of useful programming information without regard to Apple's developer status. For information on submitting articles, ask us for our **writer's kit** which includes the terms and conditions upon which we publish articles.

#### Regular Columnists

**Getting Started** • Dave Mark  
**Programmer's Challenge** • Bob Boonstra  
**Inside Info** • Chris Espinosa  
**Symantec Top 10** • Symantec Technical Support  
**Crabb's Apple** • Don Crabb  
**URLs** • Jim Straus

#### Contributing Editors

**Copland** • Steve Kiene, Mindvision  
**Database** • Liam Breck  
**Internet** • Jon Wiederspan  
**MagicCap/Telescript** • Richard Clark, General Magic  
**Misc. Topics** • Eric Gundrum  
**Performance Programming** • Jim Gochee  
**Tips & Tidbits (and Technical Editor)** • Steve Sisak

#### And our Editors...

**Publisher/Editor-in-Chief** • Neil Ticktin  
**Managing Editor** • Matt Neuburg  
**Editorial Assistant** • John Kawakami  
**Editor-at-Large** • Scott T Boyd

The names MacTech, MacTech Magazine, MacTech CD-ROM, MacTutor, the MacTutorMan logo, MacTech Web, and JavaTech are trademarks and registered trademarks of Xplain Corporation. All contents are copyright 1984-1995 by Xplain Corporation. All rights reserved. Trademarks appearing in MacTech Magazine remain the property of the companies that hold license.

**MacTech Magazine** (ISSN: 1067-8360 / USPS: 010-227) is published monthly by Xplain Corporation, 850-P Hampshire Road, Westlake Village, CA 91361-2800. Voice: 805/494-9797, FAX: 805/494-9798. Domestic subscription rates are \$47.00 per year. Canadian subscriptions are \$59.00 per year. All other international subscriptions are \$97.00 per year. Domestic source code disk subscriptions are \$77 per year. All international disk subscriptions are \$97.00 a year. Please remit in U.S. funds only. Second Class postage is paid at Thousand Oaks, CA and at additional mailing office.

**POSTMASTER:** Send address changes to **MacTech Magazine**, P.O. Box 5200, Westlake Village, CA 91359-5200.

BULK RATE  
U.S. POSTAGE  
PAID  
PERMIT NO. 135  
MIDLAND, MI 48640  
THIRD ENCLOSED

MACTECH MAGAZINE • JANUARY 1996

**GETTING STARTED**

- PowerPlant and Modeless Child Windows ..... 7  
— By Dave Mark

**CRABB'S APPLE**

- Tomorrow's Developers ..... 21  
— By Don Crabb

**CUTTING EDGE TECHNOLOGIES**

- Opening the BeBox ..... 25  
A programmer's introduction to the Be operating system  
— By Peter Potrebic and Steve Horowitz, Be Inc.

**SYMANTEC™****SYMANTEC TOP 10** ..... 46  
— By Michael Hopkins, Symantec**JAVATECH™**

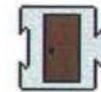
- Java Rules ..... 51  
A Java FAQ — By Hillel N. Cooperman and Aparajita Fishman

**FROM THE FACTORY FLOOR**

- Java Talk ..... 55  
— By Dave Mark

**INTERNET SOLUTIONS**

- Becoming a Macintosh Service Provider ..... 58  
Tales from the field — By Brad Scbrick and Eric Bickford

**INTERNET SPECIAL**

- Inside HomeDoor ..... 60  
Make one web server act like a network of servers — By Alan B. Oppenheimer

**INTERNET DEVELOPMENT****CGI's: AppleScript or Frontier?**

- Comparing scripting environments for CGI development ..... 63  
— By Mason Hale

**BOOK REVIEW**

- New Apple Guide Authoring Aids ..... 67  
Three books and accompanying software for Apple Guide authoring  
— By John R. Powers, III, guideWorks, LLC

**NEW APPLE TECHNOLOGY**

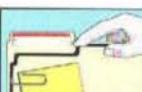
- OpenDoc: Contain Yourself ... ..... 71  
Updating applications to work with OpenDoc  
— By Eric Soldan, Apple Developer Technical Support

**PROGRAMMER'S CHALLENGE****Sliding Tiles**

- ..... 77  
— By Bob Boonstra

**UNIFORM RESOURCE LOCATORS**

- ..... 89  
— By Jim Straus

**VIEWPOINT** ..... 4**NEWSBITS** ..... 98**DIALOG BOX** ..... 90**THE CLASSIFIEDS** ..... 96**MAIL ORDER STORE** ..... 100**ADVERTISER &  
PRODUCT INDEX** ..... 111**TIPS & TIDBITS** ..... 112

By Scott T Boyd, Editor-at-Large, <http://www.bax.com/>



**O**ut of circulation for some time now, all of a sudden TMON has reappeared on the scene. Rumors have circulated since before WWDC this year that TMON would make its reemergence, only to listen to deafening silence. Well, silent no more, TMON's back! Check out <http://www.tmon.com>

TMON last saw major work for System 7 compatibility. Since then it has had something of a bumpy ride. For example, Waldemar Horwat, its author, spent a little time finishing up his Ph.D. at MIT. ICOM Simulations, the original publisher, was purchased by Viacom. As you might imagine, the media giant was a little less interested in a debugger, no matter how great, than in ICOM's multimedia expertise.

My interest in TMON goes back to 1985. I was in grad school at Texas A&M, discovering how difficult grad school can be when there's this really cool computer called Macintosh that I could spend every waking hour learning to program. Flipping through Macazine (anyone remember that great rag?) I came across a brief mention of CompUTopia, a Macintosh conference in Austin. I hopped in the car and drove to Austin.

One banquet-hall-sized room had booths all the way around, probably not more than twenty or so altogether. Just inside the entrance was a giant, inflatable Macintosh. I was having a blast hanging out with fellow Mac enthusiasts when I noticed a crowd of especially geeky types gathering around one machine. Some extremely-animated guy was driving the machine while somehow waving his arms around, too.

I went over and stared at the screen. "What on earth has he done to it?" The windows were all as wide as the monitor, and they only moved vertically, and the contents moved live. They didn't use the standard WDEF, either. "What's all that monospaced gunk in those windows? Wait a minute! I think I'm starting to understand." It gradually came into focus – I was staring at a debugger, unlike anything I had ever seen.

Soon after that I purchased my first copy of TMON, and it's served as my debugger of choice ever since. It was a great favorite among Blue Meanies during 7.0 development, too.

One of the great moments in debugging history was the moment when I asked the first PowerPC 68K emulator engineer whether TMON would work with his emulator. I don't know whether to describe the look on his face as surprise or fear. It certainly belied his confident retort of "Yes!" Shortly thereafter I tried it out on one of the very first PDMs (which later became the 6100). Sure enough, it worked fine. It's a mighty odd sight to see a low-level debugger, confident as ever that it's displaying the detailed state of a 68K chip when there's not really one inside the box...

Now TMON knows about both chips. Most of the tricks it's always known now work for the PowerPC, too – interactive assembly (just type it in) and disassembly; live displays of processor state, raw memory dumps, low memory (with names), and structure templates; and breakpoints and stepping.

TMON also knows some new tricks. For example, it indicates which direction of a branch you'll take (just like Macsbug has done for a long time). TMON also handles CFM fragments. TMON also offers filters on heap windows, so now you can limit the blocks displayed by attribute and/or resource info. And here's my favorite feature – stepping no longer does a screen swap unless it needs to.

Now, back to the history lesson. I spent some time looking carefully at picking up the product right after Viacom purchased ICOM. I decided to pass, but Allan Foster of Guru, Inc. got interested. After working out an arrangement with Viacom and Waldemar, Guru took it on. He did a huge chunk of work on it, adding most of the features mentioned above. Just about the time it was ready to ship, MindVision approached him with an offer he couldn't refuse, and now TMON is shipping under the MindVision label.

Now, no mention of debugging would be complete without mentioning two other stalwarts – Macsbug and Jasik. Apple's Jim Murphy has recently added a slew of PowerPC support items to Macsbug (too many to go into now), and it's definitely worth checking out. It's available in the usual places.

Likewise, Jasik has added some interesting items (<http://www.jasik.com>). Nosy now disassembles PEF containers, and has a fancy new resource selection dialog. The Debugger handles PowerPC-native watchpoints, and can read in the symbolic debugging info files created by Nosy's PEF disassembly.

#### DEBUGGERS FOR THE REST OF US

I'm excited to see the return of TMON. Macintosh developers deserve to have all the excellent tools they can get, and professionals should have them all. By and large, they all provide far more value than they cost. In addition, the longevity and expertise represented by folks like Jasik and MindVision brings a lot more to the table than just a piece of debugging software. I know of one developer who bought Jasik's Debugger just so he could call Steve with an occasional question. It's great to see all three debuggers undergoing active development and support!

#### FOOD FOR THOUGHT

In answer to the question, "What's the coolest stuff coming out of Apple lately?" I expected to hear about PCI machines (they're fast), the Color LaserWriter (looks good, good price), or QTVR (too cool!). I got the following answer: "Engineers." Ouch!

"A new tool for every project!" – Gordon Sheridan

Internet. Mention it and maybe your stock price will climb to \$140/share, too! I mentioned it. Maybe it's time for an acquisition...

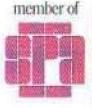


# Software Developers: Software Piracy Burns Your Profits.



VISIT OUR WEB SITE  
<http://www.hasp.com/>

© Aladdin Knowledge Systems Ltd. 1996-1998. (E98) HASP® is a registered trademark of Aladdin Knowledge Systems, Inc. All other product names are trademarks of their respective manufacturers. Mac & the Mac OS logo are trademarks of Apple Computer, Inc., used under license.



**Aladdin Benelux** 08894 19777 ■ **Aladdin Japan** 0426 60 7191 ■ **Aladdin Russia** 095 9230588 ■ **Australia** Comlab 3 8985685 ■ **Czech** Atlas 2 766085  
■ **Chile** Micrologica 2 222 1388 ■ **Denmark** Borndorff 39 57300 ■ **Egypt** Zeinoldein 2 3604632 ■ **Finland** ID-Systems 0 870 3520 ■ **Germany** CSS 201 278804  
■ **Greece** Unibain 1 8856320 ■ **India** Solutions 11 2218254 ■ **Italy** Partner Data 2 26147380 ■ **Korea** Da-e-A 2 846 4481 ■ **Mexico** SSoft 5 5493770  
■ **New Zealand** Training 4 5666014 ■ **Poland** Syntech 61 480273 ■ **Portugal** Futumatica 1 4116209 ■ **Romania** Interactiv 64 153112  
■ **South Africa** Le Roux 11 886 4704 ■ **Spain** PC Hardware 3 4493193 ■ **Switzerland** Opag 61 7169222 ■ **Taiwan** Teco 2 555 9676 ■ **Turkey** Mikrobeta 312 467 7504

Each year, the illegal use of software consumes nearly 50% of your potential revenues. With the flames of piracy eating away at your profits, can you afford not to protect your software?

Software Obtained Illegally, by region, 1993 vs. 1994

	1993	1994
Africa/Middle East	\$666,440,105	\$92,687,055
Asia	\$3,963,527,364	4,350,981,640
Europe	\$4,900,882,960	6,002,681,255
Latin America	\$821,992,751	1,334,894,665
U.S./Canada	\$2,487,360,944	3,131,455,600
Total for 1993:	\$12,840,204,124	
Total for 1994:	\$15,212,700,215	

Source: BSA

MachASP® is widely acclaimed as the world's most advanced software protection solution for Macintosh computers. Since 1984, thousands of leading Mac and PC developers have used over one million MachASP and HASP keys to protect billions of dollars worth of software. Why? Because MachASP's security, reliability, and ease-of-use led them to a simple conclusion: MachASP is the most effective software protection system available.



Today, more developers are choosing MachASP than any other software protection method. To learn why, and to see how easily you can increase your revenues, call now to order your MachASP Developer's Kit.

**1-800-223-4277**  
**ALADDIN**

*The Professional's Choice*

**North America** **Aladdin Software Security Inc.**  
Tel: (800) 223 4277, 212-564 5678  
Fax: 212-564 3377  
E-mail: sales@hasp.com  
WWW: http://www.hasp.com/

**Intl Office** **Aladdin Knowledge Systems Ltd.**  
Tel: 972-3-537 5795, Fax: 972-3-537 5796  
E-mail: aladdin@aladdin.co.il

**United Kingdom** **Aladdin Knowledge Systems UK Ltd.**  
Tel: 01753-622266, Fax: 01753-622262

**France** **Aladdin France SA**  
Tel: 1 40 85 98 85, Fax: 1 41 21 90 56

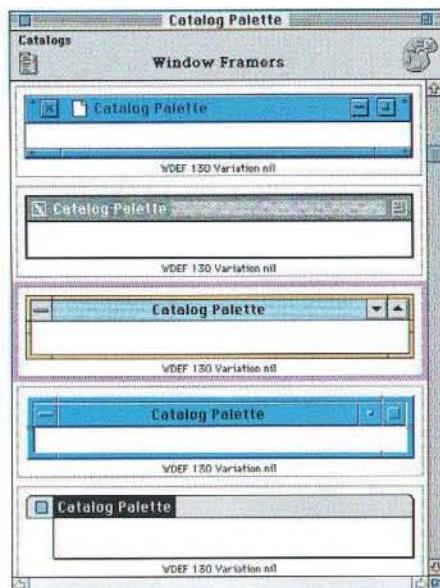
# Building Internet And Other Native PowerPC Applications Has Never Been Easier Or Faster.

## SmalltalkAgents®



SmalltalkAgents (STA) is a sophisticated rapid application development environment based on a new generation of the Smalltalk language, enabling you to easily deliver double-clickable applications.

### Copland Style GUI Look & Feel



Creating professional quality user interfaces is easy with our component parts libraries.

### VisualWorkbench

Visually manipulate all objects including source and design elements using your mouse and keyboard. Visually manage

design and project elements in a "Finder-like" desktop workspace as fluidly as you work with folders and documents on your desktop. Interactively build, wire, and interconnect reusable components and interfaces in an integrated environment.

### GUI Design & Generation

Live "Drag and Drop" manipulation to build your application's visual interface using components that "know" how to behave and autoconfigure themselves into an environment. Create new components and/or wire together existing components that can



be saved as reusable template designs for use in other applications or containers.

### DTP Engine & Word Processor

STA not only includes a programmable word processor component and HyperMedia engine, but also a powerful report writer that supports embedding of any kind of objects, movies, flows, and international text, and page layout.

### C/C++, Pascal Workbench

Compile, edit, and dynamically link C/C++, Pascal, Fortran, and Assembly code directly from within our STA VisualWorkbench as an integrated part of the Smalltalk application development process.

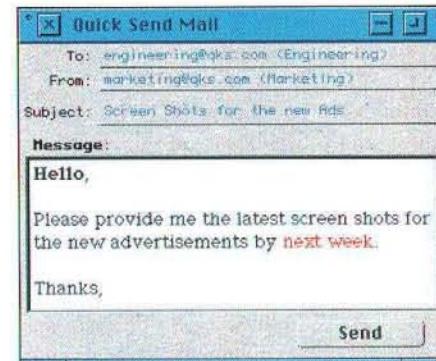
### Component-based Architecture

STA components are designed for OpenDoc

and OLE, and will give you transparent integration with OpenDoc and OLE when they become available.

### Threading & Internet Tools

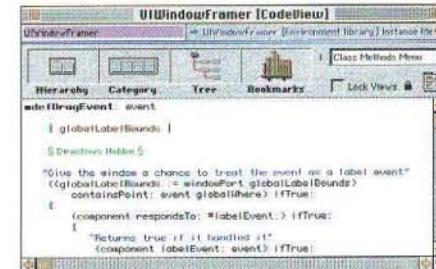
STA provides powerful support for Internet



server as well as client tool development. Pre-emptive threading, thread safe libraries and classes for TCP/IP protocols are standard features enabling you to quickly and easily deliver custom e-mail, WWW, list-server, and other dial-up/network related apps.

### PowerPC Support

STA provides binary portability across differ-



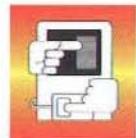
ent CPUs and Operating Systems. Design applications today on one platform and simply deploy on other platforms as required.

Contact us about our Web Server & Client Toolkit at 1-800-296-1339 or at <[info@qks.com](mailto:info@qks.com)> or visit our Web site <http://www.qks.com/>.



Quasar Knowledge Systems, Inc.  
9818 Parkwood Drive  
Bethesda, MD 20814 USA  
Tel: (301) 530-4853 Fax: (301) 530-5712

By Dave Mark, MacTech Magazine Regular Contributing Author



# PowerPlant and Modeless Child Windows

In last month's column, we built an application that featured windows with two push buttons and a scrolling picture pane. The first button beeped when you clicked it. The second button was disabled. This month, we'll extend the PictScroller program. We'll enable the second button so that when you click it, a new window appears, allowing you to select a new picture for the scrolling picture pane.

*Thanks once again to Greg Dow for all his PowerPlant help. Greg is a real friend to this column and has never been too busy to lend a hand.*

## COPY LAST MONTH'S PICTSCROLLER PROJECT

Start off by making a copy of last month's project folder. Rename it PictScroller2 or something like that. This way, if things get a little screwy, you don't have to start over from scratch. At the very least, you'll be able to start from where we left off last month.

Once your old folder is tucked safely away, open up the PictScroller2 folder. Our first step will be to add two more PICT resources to the Constructor file PictScroller.rsrc.

- Open up PictScroller.rsrc using your favorite resource editor.
- Change the resource ID of the existing PICT resource from **128** to **2001**.
- Add two more PICT resources to the file and change their resource IDs to **2002** and **2003**.
- Save your changes and quit your resource editor.

In addition to the sun PICT from last month's column, I added the moon and red car pictures from my ScrapBook.

Our next step is to edit PictScroller.rsrc using Constructor.

- Double-click on the file PictScroller.rsrc.

Constructor will open the file PictScroller.rsrc and display a window listing all the views in this file. At this point, we've got a single view, an LWindow with an id of 1 and the name PictWindow. Our first goal is to make a few changes to our existing LWindow view. Our second goal is to create a new view, an LWindow with 3 radio buttons and a mini-PICT frame.

Let's start by editing the existing LWindow.

- Double-click on the LWindow with the id of 1 (it should be the only view listed in the master view list).

The view editing window for the PictScroller LWindow will appear.

- Double-click on the titlebar of the window embedded in the view editing window (the title bar says **PictScroller**).

An info window for the PictScroller window will appear. This next step is *incredibly important*:

- Change the **Class ID** field from **wind** to **CpsW**.
- Close the PictScroller info window.

The four letter (case sensitive!) code tells PowerPlant what type of object we are creating. The code 'wind' corresponds to the class LWindow. That's the class we used last month. This month, we'll be subclassing LWindow with a class named CPictScrollerWindow. When you enter the CPictScrollerWindow class definition (later in the column), you'll see that we create an enum constant with the name **class\_ID** and the value '**CpsW**'. Each time you create a class that implements a PowerPlant view, you'll enter the class' **class\_ID** code in the **Class ID** field in the view's info window.

- Double-click on the LPicture pane (it has a pane id of 1003).
- When the pane info window appears, change the PICT Resource ID to **2001**.

The first of your three PICT resources (the one with the resource ID 2001) should now be displayed in the scrolling pane.

- Close the LPicture pane info window.
- Double-click the **Dialog** button (the right button).
- Click on the **Enabled** check box (so that it is checked).
- Change the **Value Message** to **1001**.
- Change the **Button Title** to **Picture...**
- Close the button's pane info window.

The button will now say **Picture...** and will no longer be disabled. Also, when it is clicked in your application, it will broadcast a message with a value of 1001 to any listeners.

Now let's add a new view.

- Close the view editing window for the PictWindow LWindow.
- Select **New Resource** from the **Edit** menu.
- When the view naming dialog appears, make sure **LWindow** is selected from the popup menu, type **Pict Selector (Child)** in the edit field, and click the **OK** button.

A new view editing window will appear. Before we add any items to the new view, change the view's ID to **2000**.

- Close the view editing window.
- Select **LWindow 128** in the master view list, then select **Resource Info** from the **Edit** menu.
- Change the **Resource ID** from 128 to **2000**.
- Close the resource info window.
- Double-click on the Pict Selector view in the master view list.

A view editing window for view 2000 will appear.

**Note:** Greg Dow uses a numbering convention that I'll try to stick to from now on. He numbers all his new views by thousands. So his views have IDs like 1000, 2000, 3000, etc. The items within a view start at one plus the view ID. That means that the items in this new view will be numbered 2001, 2002, 2003, etc. If you have groups of items (like radio buttons, for example), you might want to leave holes in your numbering scheme. For example, you might number your radio buttons 2001, 2002, and 2003, then start the next set of items with 2010, 2011, 2012. As always, pick a scheme you like and try to be consistent.

- Double-click on the window inside the view editing window.
- When the info window appears, change its settings to match those shown in Figure 1.
- Close the info window.

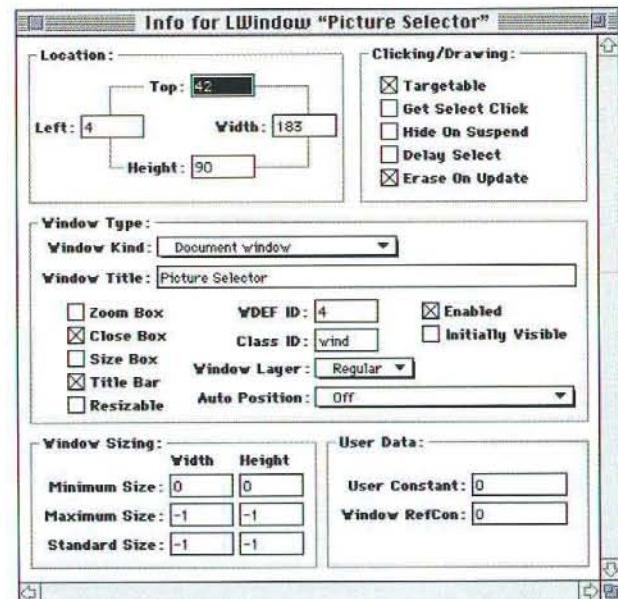


Figure 1. The info window for the Picture Selector window.

Next, you'll create the four items that make up this new view: three radio buttons and a mini-picture frame.

- Drag an LStdRadioButton from the palette window onto the Picture Selector window.
- Double-click the new radio button.
- When the info window appears, change its settings to match those shown in Figure 2.
- Close the info window.

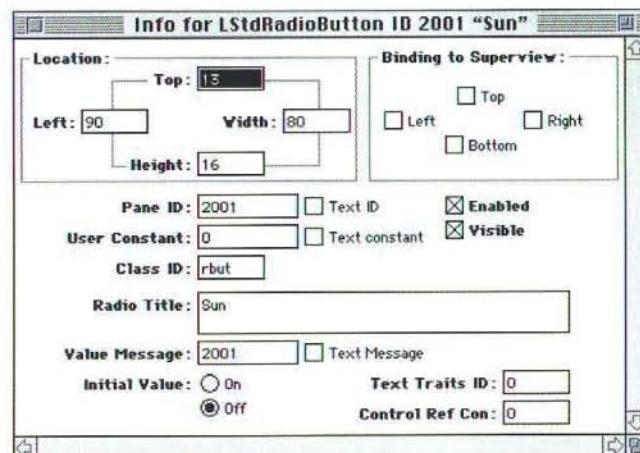


Figure 2. The info window for the Sun radio button.

- Drag a second LStdRadioButton from the palette window onto the Picture Selector window.
- Double-click the new radio button.
- When the info window appears, change its settings to match those shown in Figure 3.
- Close the info window.

Announcing



## Why so many developers are switching to MicroGuard copy protection

- MicroGuard is committed to uncompromising technological superiority

"Technology at its peak" is our commitment to you. That is why we have brought you **MicroGuard Plus™**. And, MicroGuard Plus is **100% backwards** compatible with MicroGuard. This means MicroGuard and MicroGuard Plus can be used interchangeably. Just as we promised!

- MicroGuard offers you the most sophisticated network protection

Our network protection, **MicroGuard Net™**, is so superior, we had to hire an Apple network engineer to execute our specifications.

- MicroGuard is the only key developed by Mac developers, and is the first and only 100% ADB savvy key

We have been developing Mac applications as a seed development house since 1984. We are not a PC protection company that has come to you with a Mac product. MicroGuard is fully ADB savvy and offers extended addressing. Unlike other protection devices, MicroGuard never clashes with other keys. Only MicroGuard offers this level of sophistication.



- MicroGuard has now surpassed its own technological lead, actually improving on the best

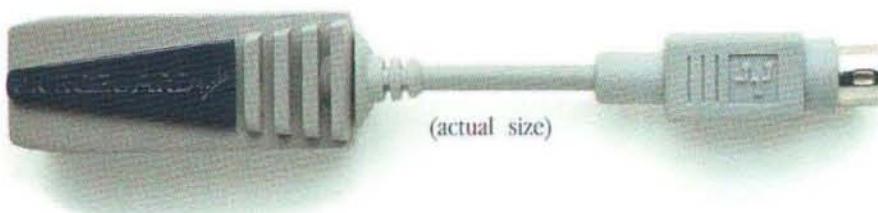
MicroGuard Plus is everything MicroGuard is, plus 40-bit encryption, two additional passwords, 64-Bit Array, 32-byte public area, 45% size reduction, enhanced counter and more. In addition, MicroGuard Plus offers two new utilities: **QuickGuard™** and **EasyGuard™** allow you to protect your applications without touching your source code. The only feature that is not plus is the price. :-)

- MicroGuard is the best selling Macintosh key in the world

MicroGuard sells more Macintosh copy-protection keys than anyone else in the world!

- MicroGuard delivers developer support within 24 hours

We will answer any inquiry you have within 24-hours. We also have a fully loaded AppleLink bulletin board which contains all our libraries, tech notes, Q&A and nearly everything you'll ever need!



For more information and to order a Developer's Kit or to receive a free CD ROM about MicroGuard, please contact us at:

MicroGuard USA: Tel: (303) 320-1628 • Fax: (303) 320-1599 • AppleLink: M.GUARD  
International: Tel: (972) 3 558-2345 • Fax: (972) 3 558-2344 • AppleLink: MICROGUARD



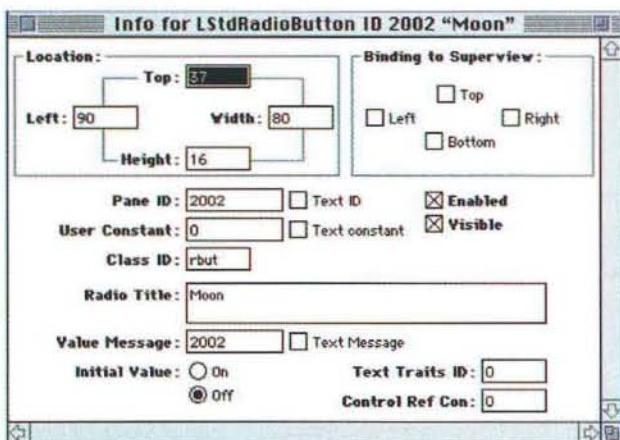


Figure 3. The info window for the Moon radio button.

- Drag a third LStdRadioButton from the palette window onto the Picture Selector window.
- Double-click the new radio button.
- When the info window appears, change its settings to match those shown in Figure 4.
- Close the info window.

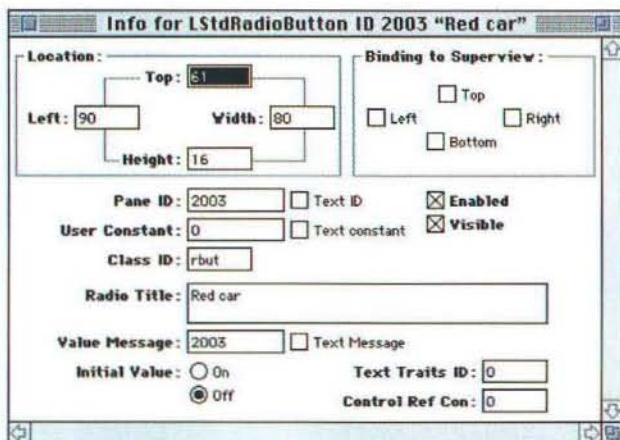


Figure 4. The info window for the Red car radio button.

As is, these three radio buttons will act independently. That is, if you click on one to turn it on or off, it will have no effect on the others. To fix this problem, we need to group the three buttons into a radio button group.

- Hold down the shift key and select all three of the radio buttons.
- Select **Make Radio Group** from the **Arrange** menu.

Next, we'll create the mini-picture frame.

- Drag an LPicture from the palette window onto the Picture Selector window.
- Double-click the new LPicture pane.
- When the info window appears, change its settings to match those shown in Figure 5.

- Close the info window.
- Quit Constructor. Be sure to save your changes.

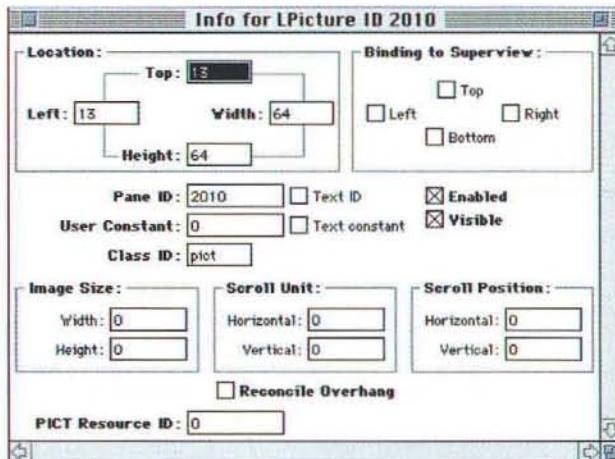


Figure 5. The info window for the LPicture min-picture frame.

That's about it for your Constructor session. Figure 6 shows my finished Pict Selector view. Notice that none of the radio buttons is turned on and that the mini-picture frame is just a grey square. We'll set up the buttons and display the right picture in our source code, which we'll get to next.

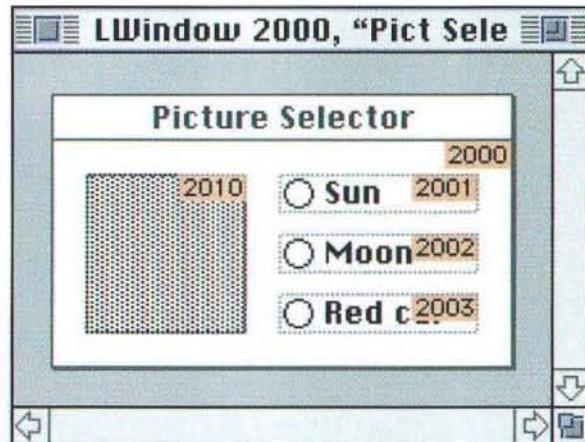


Figure 6. The finished Pict Selector view.

## ENTERING THE SOURCE CODE

We'll modify two source code files and add two new source code files. We'll start with some changes to *PictScroller.cp*.

- Open the project file *PictScroller.pj*.
- Open the file *PictScroller.cp*.
- Add the line:

```
#include "CPictScrollerWindow.h"
```

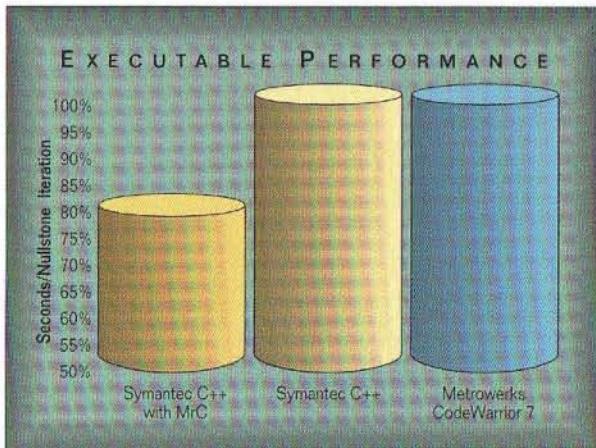
immediately after the *#include* of *PictScroller.h*.

*CPictScrollerWindow.h* contains a brand new class

**N**ow, through a joint development agreement, Symantec and Apple™ Computer let you produce the fastest Power Mac code.

Symantec C++ for Power Macintosh™ now comes with MrC—Apple's new optimizing compiler.

Industry-standard Nullstone tests show that



*Code compiled using MrC runs an average of 22% faster than code compiled with the standard Symantec C++ compiler or Metrowerks Code Warrior 7™.\**

size and color. Organizing and navigating a project has never been easier.

In addition, Symantec C++'s multi-threaded environment gives you the ability to edit and write code while you compile. And our visual architect lets you quickly draw the interface. Corresponding code is then generated automatically.

## WHEN MRC GOES TO WORK, SYMANTEC C++ APPLICATIONS GET 22% FASTER.

applications compiled with MrC run an average of 22% faster.

### DEVELOP FASTER APPLICATIONS FASTER.

Not only can you develop the fastest Power Mac applications, you can write them fast, too. New AppleScript support lets you automate repetitive tasks. While the new linker provides fast turnaround for incremental builds.

With the fully integrated class browser, you'll quickly navigate your C++ class library. And support for templates and multiple inheritance further boosts your productivity.

### ORGANIZE AND MANAGE PROJECTS EASILY.

The new Project Manager

lets you organize and manage nested projects. You can display hierarchical groups as folders within a project window for easier organization.

The editor gives you unlimited split panes and full text formatting—font,

MRC COMPILER  
*produces the fastest Power Mac applications*

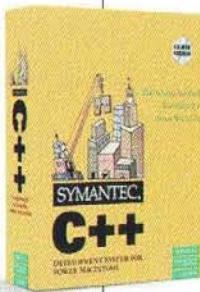
APPLESCRIPT  
*automates the build process*

NEW INCREMENTAL LINKER  
*provides fast incremental builds*  
TEMPLATE AND MULTIPLE  
INHERITANCE SUPPORT  
*increases productivity*

NESTED PROJECTS AND FOLDERS  
*let you organize and navigate projects*

MULTI-THREADED  
ENVIRONMENT  
*lets you edit and write code while compiling*

VISUAL ARCHITECT  
*builds your interface visually*



All in all, Symantec C++ is a great way to develop the fastest applications for Power Mac.

### THREE CDS FOR THE PRICE OF ONE.

When you register as a Symantec C++ owner, you'll be enrolled in the Symantec C++ Subscription for Macintosh program. Subscribers will automatically receive two free product updates (on CD ROM) so you'll always have the latest features and tools.

Learn more about Symantec C++ on the Internet at [www.symantec.com](http://www.symantec.com). Or call 1-800-628-4777, Extension 9H22 for more information.

# SYMANTEC.

Offer valid in U.S.A. only. \*Industry standard Nullstone Test run 9/29/95 on Power Mac 6100/60. For more information in Canada, call 1-800-365-8641. In Australia, call 2-879-6577. In Europe, call 31-71-353111. Symantec is a registered trademark of Symantec Corporation. All other trademarks are the property of their respective holders. All rights reserved. © 1995 Symantec Corporation.

definition, which we'll get to in a bit. This is the class with the `class_ID` constant '`CpsW`' mentioned earlier in the column. Last month, we embedded our message handling code in `PictScroller.cp`. This month, we'll create a subclass of `LWindow` and handle the messages (like 1001 from the **Beep** button and 1002 from the **Picture...** button) in our new class.

- In the function `CPPStarterApp()::CPPStarterApp()`, add this code at the end:

```
URegistrar::RegisterClass(CPictScrollerWindow::class_ID,
    CPictScrollerWindow::CreatePictScrollerWindowStream);
```

This code registers our new class, passing in the `class_ID` code and a pointer to the member function that creates a new object.

- In `CPPStarterApp::ObeyCommand()`, comment out these two lines in the `cmdNew` case of the switch statement:

```
//LStdButton *theButton =
// (LStdButton *)theWindow->FindPaneByID( 1000 );
//theButton->AddListener( this );
```

Since we will no longer be handling any messages in this class, we no longer have to add ourselves as a listener. For the same reason, we can delete the function

```
CPPStarterApp::ListenToMessage();
```

- Delete the function `CPPStarterApp::ListenToMessage()`.
- Save your changes and close the source code file.
- Now open the file `PictScroller.h`.
- Comment out the reference to public `LListener` in the first line of the `CPPStarterApp` class definition:

```
class CPPStarterApp : public LApplication
/*, public LListener*/
```

- Comment out the declaration of the member function `CPPStarterApp::ListenToMessage()`.

```
//virtual void ListenToMessage( MessageT inMessage,
//    void *ioParam);
```

Your next job is to create new source code files to hold your new class definition and your new class source code.

- Create a new source code file.
- Type in this source code:

```
#include <LWindow.h>
#include <LListener.h>

class CPictScrollerWindow :
    public LWindow,
    public LListener {

public:
    enum { class_ID = 'CpsW' };
```

```
static CPictScrollerWindow*
CreatePictScrollerWindowStream(LStream *inStream);
CPictScrollerWindow(LStream *inStream);
virtual void ListenToMessage(MessageT inMessage,
    void *ioParam);

virtual Boolean AllowSubRemoval(
    Commander *inSub);

protected:
    Lwindow *mChildWindow;

    virtual void FinishCreateSelf();
    void DisplayPictSelector();
};
```

- Save the source code file as `CPictScrollerWindow.h`.
- Close the file `CPictScrollerWindow.h`.

There are several important things to remember about `CPictScrollerWindow.h`. We are subclassing `LWindow` and `LListener`. We want to behave like a window and support listening to messages (in our case, we want a window that responds to control clicks). We've removed the listening behaviour from the `LApplication` subclass `CPPStarterApp` and added it to `CPictScrollerWindow`.

Notice the enum constant `class_ID` with its corresponding four byte code '`CpsW`'. If you define your own class and will be adding listeners to a specific view, be sure the class defines a `class_ID` and be sure that `class_ID` code is entered in the **class ID** field for that view in Constructor.

You might be wondering why we modified the **class ID** field in the `PictScroller` view (the view with the two push buttons), but not in the `Pict Selector` view (the view with the three radio buttons). That's because the class ID only matters if your controls generate messages *and* if you add a listener to listen to those messages. We won't install listeners for any of the radio buttons. See the call `UReegrator::LinkListenerToControls()` in `CPictScrollerWindow::DisplayPictSelector()`. The class ID acts as a kind of linkage, linking message senders to the class that will receive those messages. As you'll see, we'll handle the radio buttons without using listeners, so we didn't need to modify the class ID field in the `Pict Selector` view.

Let's get to the `CPictScrollerWindow.cp` source code.

- Create another new source code file.
- Type in this source code (you can ignore the comments):

```
#include "CPictScrollerWindow.h"
#include <LStdControl.h>
#include <LPicture.h>
#include <UReegrator.h>

CPictScrollerWindow*
CPictScrollerWindow::CreatePictScrollerWindowStream(
    LStream *inStream)
// This function gets called to create a new
// CPictScrollerWindow object.
{
    return (new CPictScrollerWindow(inStream));
}
```

# They Say To Survive the Mac Needs...



New  
Management



A Miracle

## We Say It Just Needs Better Development Tools

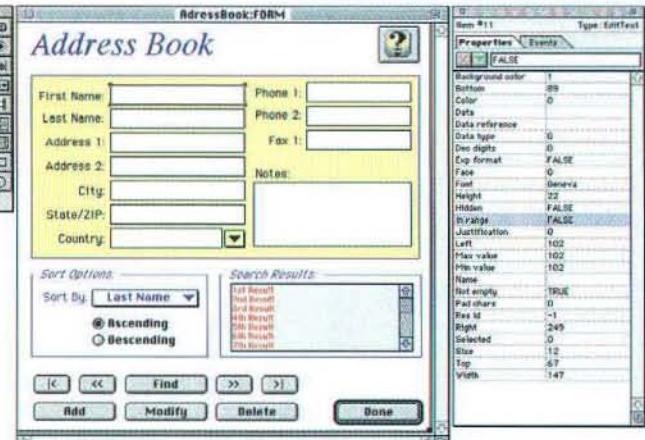
Finally there's a complete RAD solution for the Macintosh—the rapid application development tool Mac developers have always needed. VIP-C is the fastest, easiest way to create complete, professional, stand-alone Mac and Power Mac applications—period. If you're tired of juggling editors, interface design tools,

debuggers and compilers, or intimidated by the volumes of reference material required to get started, end your search for development utopia here. VIP-C™ gives you everything you need in one box, at a price anyone can afford. And with VIP-C you program the way you want. Work in a traditional bottom-up approach, or design your program's interface first with a powerful, integrated Form editor—complete with plug-in control modules. Because your program is in standard ANSI C, it's portable and completely compatible with other past, present and future C development environments. We've even built in a direct hot-link to Metrowerks' CodeWarrior compiler. Help save the Macintosh, buy VIP-C today!



Introducing  
**VIP-C™ 2.0**

Only  
**\$295**  
Regularly \$495.



With VIP-C's new Form editor you can design your application's interface and link events directly to your code!

Order VIP-C Today!  
**800-484-9817 (code 8472)**

er fine Mainstay products:

**Phyla**  
Object-Oriented  
Database

**MacFlow**  
Flowchart Design  
and Development

**Plan & Track**  
Project Planning  
and Management

**VIP-BASIC**  
Visual Interactive  
Programming in BASIC

**Marco Polo**  
Document Imaging  
and Management

**MarkUp**  
Document Editing  
and Review

**Captivate**  
Essential  
Graphics Utilities

```

CPictScrollerWindow::CPictScrollerWindow(
    LStream *inStream):LWindow(inStream)
{
    // Here's the constructor. Notice that we just pass the input parameter on to the
    // LWindow constructor. We have added a data member to our LWindow subclass
    // and initialize it here. mChildWindow is a pointer to a Pict Selector window (aka, a
    // child window) if one exists. If you click in the Picture... button, if a child window
    // exists, it is brought to the front. If the child window does not exist, it is created.
    {
        mChildWindow = nil;
    }

    void CPictScrollerWindow::FinishCreateSelf()
    // FinishCreateSelf() overrides its LWindow counterpart and is called automatically at
    // object construction time. We'll add our two listeners: one for the Beep button and
    // one for the Picture... button.
    {
        LStdButton *theButton = (LStdButton*) FindPaneByID(1000);
        theButton->AddListener(this);
        theButton = (LStdButton*) FindPaneByID(1001);
        theButton->AddListener(this);
    }

    void CPictScrollerWindow::ListenToMessage(
        MessageT inMessage, void *ioParam)
    {
        switch (inMessage) {
            case 1000:
                // Beep if the Beep button is pressed.
                SysBeep(10);
                break;
            case 1001:
                // Open the Pict Selector window if the Picture... button is pressed.
                DisplayPictSelector();
                break;
            case 2001:
            case 2002:
            case 2003:
                if (((Int32*)ioParam) == Button_On) {
                    // When ListenToMessage() gets called in response to a message from a control, it
                    // puts the value of the control in the param ioParam. We only take an action when a
                    // radio button is being turned on. We don't do anything in response to a button
                    // being turned off.
                    LPicture *thePicture =
                        (LPicture*) mChildWindow->FindPaneByID(2010);
                    if (inMessage != thePicture->GetPictureID()) {
                        thePicture->SetPictureID(inMessage);
                        Rect pictFrame;
                        thePicture->CalcLocalFrameRect(pictFrame);
                        thePicture->ResizeImageTo(
                            pictFrame.right - pictFrame.left,
                            pictFrame.bottom - pictFrame.top, false);
                        thePicture->Refresh();
                        thePicture = (LPicture*) FindPaneByID(1003);
                        thePicture->SetPictureID(inMessage);
                        thePicture->Refresh();
                    }
                }
                break;
        }
    }

    void CPictScrollerWindow::DisplayPictSelector()
    {
        // If the Pict Selector window doesn't exist, we'll create it.
        if (mChildWindow == nil) {
            mChildWindow = LWindow::CreateWindow(2000, this);
            // This call searches the specified Ridl resource (in this case, 2000) and calls
            // AddListener for each item in the Ridl. A Ridl resource is much like a DITL
            // resource. It is a list of broadcasting pane IDs. Each of our radio buttons is a
            // broadcasting pane (broadcasts a message). When we grouped the three radio
            // buttons, Constructor created a Ridl resource listing the three radio button pane
            // IDs. Call LinkListenerToControls() if you have a Ridl, or AddListener() for each
            // broadcasting control if you don't have a Ridl.
            URewriter::LinkListenerToControls(
                this, mChildWindow, 2000);
        }
        // Gets the pane ID of the picture pane in the scroller window
    }
}

```

```

LPicture *scrollerPicture =
    (LPicture*) FindPaneByID(1003);
LStdRadioButton *theRadioButton =
    (LStdRadioButton*) mChildWindow->FindPaneByID(
        scrollerPicture->GetPictureID() );
// Our Pict scaling code is executed when a message is sent to ListenToMessage(),
// above. This code also calculates which picture should be drawn in the miniframe.
// To be sure that this code gets executed, we first turn off the appropriate radio
// button then turn it back on again.
theRadioButton->SetValue(Button_Off);
theRadioButton->SetValue(Button_On);
mChildWindow->Show();
} else {
    mChildWindow->Select();
}
}

Boolean CPictScrollerWindow::AllowSubRemoval(
    LCommander *inSub)
{
    // AllowSubRemoval() is called by PowerPlant (by LWindow::AttemptClose() and
    // LWindow::DoClose()) when an LWindow is closed. This is the hook where you
    // might put up a "Save Changes" dialog and not close the window if Cancel was
    // clicked. In our case, we won't put up this kind of dialog. Instead, we'll just mark
    // the mChildWindow as nil and return true, saying it is OK to delete the child
    // window. It should be noted that AllowSubRemoval() is called when any window
    // that has a super-commander is closed (-n general, all windows will have a super-
    // commander - perhaps the LApplication object). When you close the parent
    // window, the AllowSubRemoval() of the parent window's supercommander (the
    // LApplication object's AllowSubRemoval()) gets called. We'll learn about sub- and
    // supercommanders in a future column.
    if (inSub == mChildWindow) {
        mChildWindow = nil;
    }
    return true;
}

```

- Save the source code file as CPictScrollerWindow.cp.
- Select **Add Window** from the **Project** menu to add the file to the project.
- Close the file CPictScrollerWindow.cp.

## RUNNING THE PROJECT

That's about it. Run the project. If you removed objects before you copied last month's project, you'll have a minute or two to wait for the PowerPlant classes to recompile. Once your program runs, you'll see a window similar to the one in Figure 7.

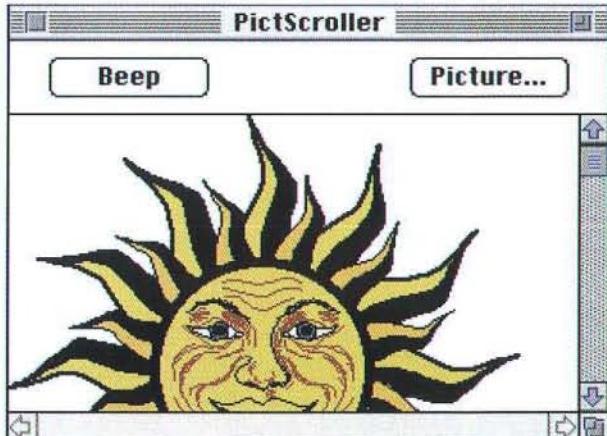
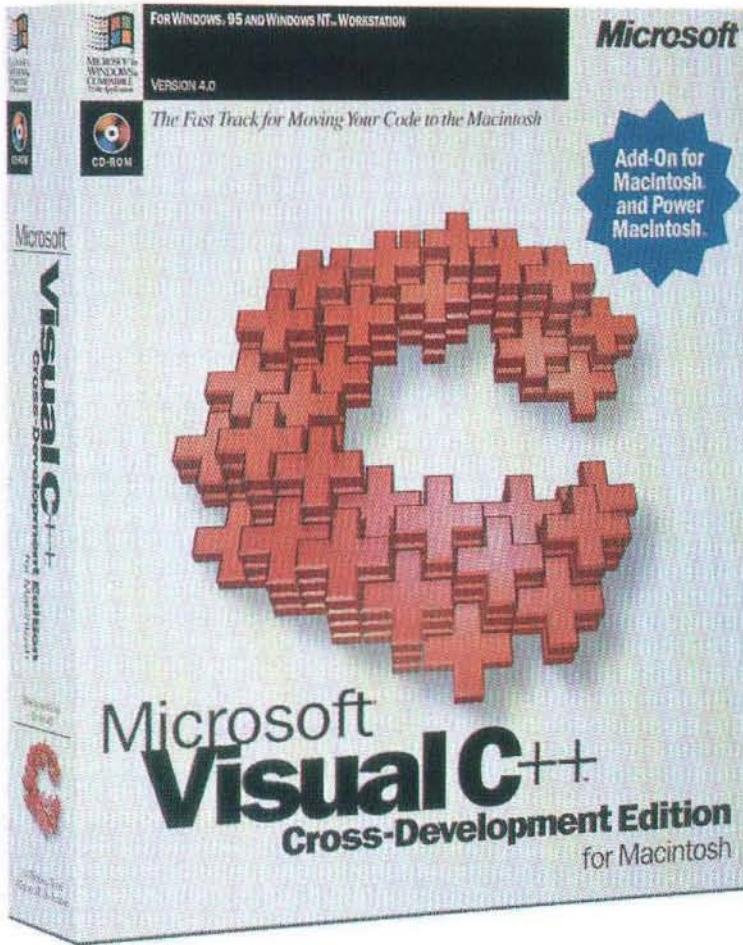


Figure 7. The main, PictScroller window, showing two push buttons and a scrolling picture.



# Bring out the best in both worlds.

Using just one toolset to target multiple platforms, you can increase your user base and knock months off your development time. With Microsoft® Visual C++™ Cross-Development Edition for the Macintosh\*, you can reuse up to 90% of your code from your Windows-based applications to create the same applications for the Macintosh®, with the familiar Macintosh interface.

#### Features Include:

- *Port Windows®-based features easily to the Macintosh*, including multiple document interface, print preview, and floating toolbars. The Windows Portability Library does the work for you.
- *True native Macintosh programming*: Program directly to the System 7 API to take advantage of unique Macintosh features such as Publish and Subscribe.
- *Recompile for the Mac™*: Target both the Windows and Macintosh operating systems using just one set of source code written to Microsoft Foundation Classes and the Microsoft Win32® API.

- *Power Macintosh™ Support*: Including a fully optimizing compiler and integrated debugger that adapts to the PowerPC™ chip when displaying information in the register contents and disassembly windows.
- *Code Fragment Support*: for the Power Macintosh which translates to better code sharing among applications and faster, trimmer applications with very little development overhead.
- *OLE support*: You can now easily port your Win32 and MFC OLE applications to the Macintosh using OLE for the Macintosh version 2.06.
- *ODBC support*: You can call ODBC directly or use it through the appropriate MFC classes.

For more information: <http://www.microsoft.com/visualc>  
or call (800)719-5577.

**Microsoft**

WHERE DO YOU WANT TO GO TODAY?™

\*This add-on toolset requires Visual C++ for Intel® platforms, available separately.

©1995 Microsoft Corporation. All rights reserved. Microsoft, Visual C++, Win32, *Where do you want to go today?*, and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Macintosh is a registered trademark and Power Macintosh is a trademark of Apple Computer, Inc., used under license. Mac is a trademark of Apple Computer, Inc. Intel is a registered trademark of Intel Corporation. PowerPC is a trademark of International Business Machines Corporation.

# The Ultimate Mac & Power Mac Imaging Toolkit!

**IMPORT + EXPORT + THUMBNAILS + 36 FILE FORMATS + DISPLAY + IMAGE GUARANTEE  
PRINTING + COMPRESSION + IMAGE PROCESSING + COLOR REDUCTION**

## Ultimate Imaging Toolkit

AccuSoft provides the ultimate imaging toolkit solution with the highest performance, most formats & platforms, most complete API and the best pricing. That is why we are the industry leader and why over 5000 companies have chosen AccuSoft for their imaging needs!

## Performance

AccuSoft has always been known as the performance leader. We know that you want the fastest imaging possible and that *fast* is never fast enough. Therefore, we constantly work on improving performance to keep us (and you) ahead of the competition.

## Quality

AccuSoft has become the leader in imaging toolkits due to our untiring commitment to quality. Not just product quality, which can be seen in our unique guarantees, but also service quality from our special fast delivery

program, top-rated technical support and rock-solid technology.

## Mac & Power Mac

The Mac versions of the Image Format Library provides Code Resource files that are compatible with any Macintosh development system including ThinkC, MPW, and Code Warrior. These versions use the same interface as other versions for easy cross-platform development and are available for both Mac and Power Mac systems. An XCMD version is also available.

## Pro Gold

The Pro Gold versions of our imaging toolkits are unbeatable for performance and special features like scale to gray, sub-degree rotation, sub-second decompress & display, sub-second screen rotation, huge image handling and more. If you want the best performance available anywhere, at any price, this is it.

## Cross Platform

With this toolkit, you can sell your applications on many different platforms without having to re-code the imaging portion. AccuSoft's cross platform design is tailored for easy porting, and since we support ALL platforms, your products can be sold to every market.

## Order Today

Call now and you can start writing high performance imaging applications in less than an hour. Our unique 30 minute delivery program is also the fastest in the business!

**Toll Free: (800) 525-3577**

Internet: <http://www.accusoft.com>

CompuServe: Go AccuSoft

**Platforms Supported:** Macintosh, Power Macintosh, Windows, Win95WT, DOS, DOS32, VBX, OCX, OS/2, FoxPro, SUN OS, Solaris, HP-UX, AIX, IRIX, SCO  
**Over 36 File Formats Supported:** MAC, TIFF, JPEG, Group III, Group IV, PCX, TGA, DIB, DCX, GIF\*, BMP, WMF, PICT, WPG, EPS\*, KFX, RLE, LV, CALS, ATT, CLP, XWD, IMG, IFF, SUN, XBM, ICO, ICOA, GX2, XPM, ASCII, CUT, BRK, PSD, MSP, PNG\*\*, Photo CD



Look for the AccuSoft Image Guarantee™ or the AccuSoft trademark on your favorite software products as a statement of superior quality.



You can start using this AccuSoft product today by taking advantage of our unique 30 Minute Delivery Program.

**AccuSoft**  
High Performance Imaging™

Two Westborough Business Park Westborough, MA 01581 Tel (508) 898-2770 FAX (508) 898-9662

©1995 AccuSoft Corporation. All Rights Reserved.

\*Available with license from Unisys. \*\*Free Upgrade for 5.0 users. PNG is the replacement format for GIF 1. Raster only. 2. Read only (Does NOT require separate DLL from Kodak.)

Click on the **Beep** button. You should hear a beep. Click on the **Picture...** button. A Picture Selector window should appear (Figure 8). Click on a few radio buttons and verify that the picture changes in both the mini-frame and in the PictScroller window. Click on the PictScroller window to bring it to the front. Click on the **Picture...** button again. Notice that the Picture Selector window came to the front, as opposed to the program creating a new one.

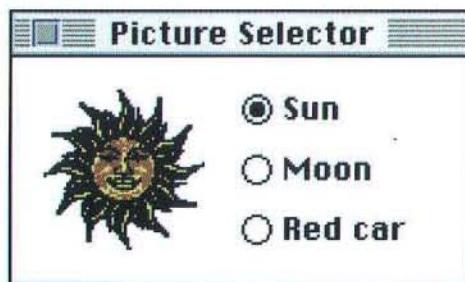


Figure 8. The Picture Selector window.

Select **New** from the **File** menu and create a second PictScroller window. Click on that window's **Picture...**

button to bring up a second Picture Selector window. Click on radio buttons in each Picture Selector window to convince yourself that each is tied only to its own parent window. Now close one of the PictScroller windows. Notice that that window's Picture Selector window also disappears!!! As I said in the program comments, this all has to do with commanders, subcommanders, and supercommanders. We'll get into all that in future columns.

## TILL NEXT MONTH...

Well, that's about it for PictScroller. I think we'll start next month's column with a brand new program. See you then...



**TO RECEIVE INFORMATION ON ANY PRODUCTS  
ADVERTISED IN THIS ISSUE,  
SEND YOUR REQUEST VIA INTERNET:  
PRODUCTINFO@XPLAIN.COM**

*Measure*  
your application development time  
*with a*



instead  
of a



## Pictorius brings *real* Power and Productivity to RAD

TEST DRIVE  
TODAY

The Test Drive CD-ROM contains limited-use versions of Prograph CPX and Peregrine and Prograph Classic Freeware  
If the Test Drive CD-ROM is missing, call us at 1-800-927-4847 and we'll rush one to you



*Build applications  
as fast as you can visualize them*

**BONUS**

68k & PowerMac Compiler  
Free Year of Updates and Support

“...a program written in Prograph typically takes about one-third to one-half of the programming time needed to write an equivalent program in a textual language like C...”

“Prograph allows for rapid program development with a minimum of effort and debugging.”



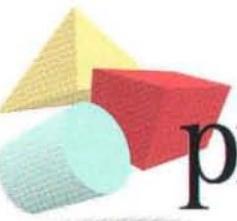
Dr. Scott B. Steinman  
MacTech Magazine

*Build client/server applications and databases  
as fast as you can visualize them.*

**BONUS**

Free Year of Updates and Support  
Free 4D Database Migration Tool

“We’re an Oracle shop and it’s usually a huge effort to build a customized front-end but Peregrine makes that a lot easier. With the automatic generation of input and output windows, we can have an app in 15 minutes that’s ready for testing and customizing.”



**pictorius<sup>®</sup>**  
INCORPORATED

*Pushing the Limits of Productivity*

1-800-927-4847

[www.pictorius.com](http://www.pictorius.com)

[sales@pictorius.com](mailto:sales@pictorius.com)



*Introduce yourself to visual,  
object-oriented development with  
Prograph Classic Freeware.*

Prograph Classic freeware  
is a great introduction  
to the Prograph world  
of rapid application development.

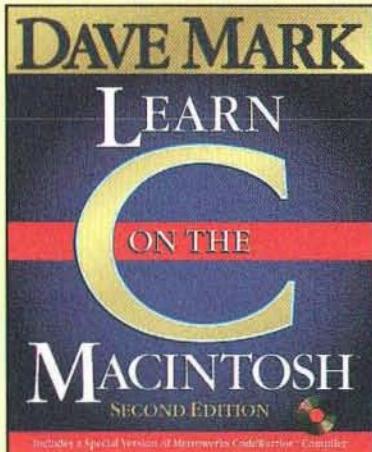
Upgrade to Prograph CPX  
when you’re ready for  
professional level application  
development.



**System Requirements:** Peregrine requires a Power Mac or Macintosh (68040 or better) with System 7 or higher. 20MB of RAM and a 15MB partition. 43MB of hard disk space. Prograph CPX requires a 68020 or greater machine with System 6.0.7 or higher. Minimum 7MB partition and 17MB of disk space. Prograph Classic requires a Mac Plus or better with 128k, a hard disk and 2MB RAM.

ALL TRADEMARKS AND REGISTERED TRADEMARKS ARE PROPERTIES OF THEIR RESPECTIVE COMPANIES.

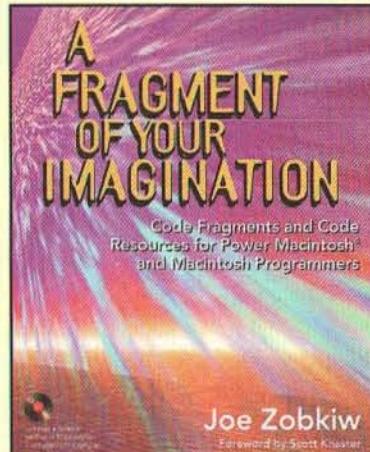
# NEW BOOKS FOR MACINTOSH DEVELOPERS FROM MACINTOSH CODING INTO



by **Dave Mark**

Anyone who can use a Mac can learn C, and all the information needed to do it is right here! *Learn C on the Macintosh, Second Edition*, has been revised and updated to include fresh code, enhanced lessons, and a CD-ROM with Metrowerks CodeWarrior Lite and an assortment of games, shareware, graphics, and plenty of other neat stuff.

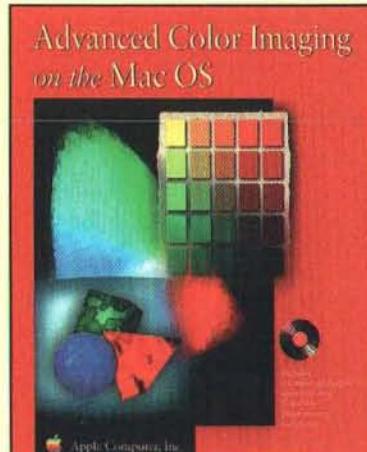
**Book/CD-ROM, 496 pages**



by **Joe Zobkiw**

Here's some practical help for creating code resources and code fragments for the Macintosh and Power Macintosh. Rather than gathering and indexing code, the author teaches you more about how the Macintosh system functions as a whole. He also provides hard to find information about techniques used to structure and build fat, safe fat, and accelerated code resources for use on both 680x0 and Power Macintosh. All code is reusable and is provided on the disc, along with Metrowerks CodeWarrior Lite.

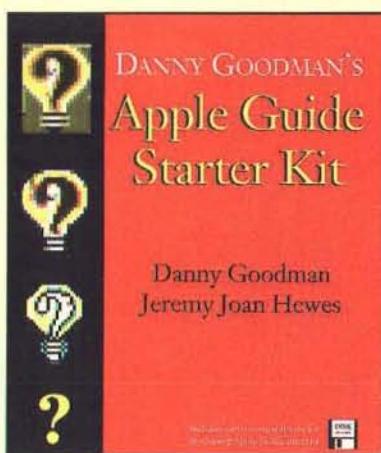
**Book/CD-ROM, 528 pages**



by **Apple Computer, Inc.**

This is the official guide for enhancing your Macintosh software's color capabilities. Covering the Color Picker, the ColorSync Manager, the Palette Manager, and the Color Manager, the book provides conceptual information and code samples. Its companion CD-ROM offers a complete reference to the data structures, routines, and resources described in the book and contains a sample application demonstrating ColorSync programming techniques.

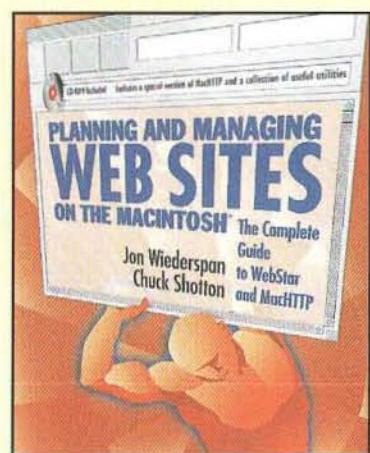
**Book/CD-ROM, 352 pages**



by **Danny Goodman and Jeremy Joan Hewes**

Two highly respected experts offer a different approach for creating your own Apple Guide databases. With this program, you can make guides quickly and easily, without having to learn a scripting language, write coded files, or use several different files and programs to produce your database. The authors provide advice and tips on how to design a good Guide, from planning through testing, revising, and indexing.

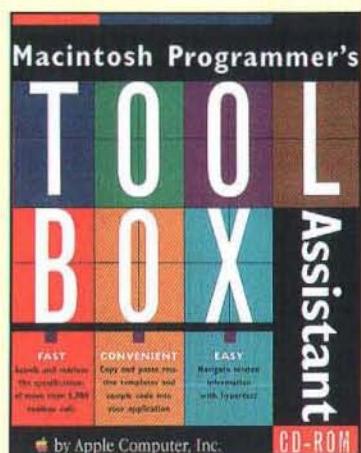
**Book/disk, 320 pages**



by **Jon Wiederspan and Chuck Shotton**

This book is a definitive guide to setting up and running a Web site on the Macintosh, written by two acknowledged experts in the field. It skillfully teaches you everything you need to know about using WebSTAR, the best known HTTP server software and its shareware predecessor MacHTTP, as well as about writing CGI applications for your server. A special version of WebSTAR, plus tons of useful software, are on the CD-ROM.

**Book/CD-ROM, 384 pages**



by **Apple Computer, Inc.**

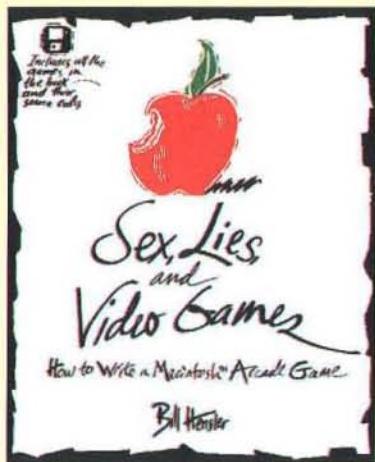
Have you ever needed to find current information about using a crucial toolbox call while in the middle of writing your application? Now with just a click of your mouse, you can get instant access to more than 5,000 toolbox calls. This CD-ROM database contains all routines, data structures, and constants as documented in *Inside Macintosh*. With a lightning fast search engine, it helps you find key data structures, resources, constants, and functions when you need them the most.

**CD-ROM**

ADDISON-WESLEY BROUGHT TO YOU BY

MacTech™  
MAGAZINE

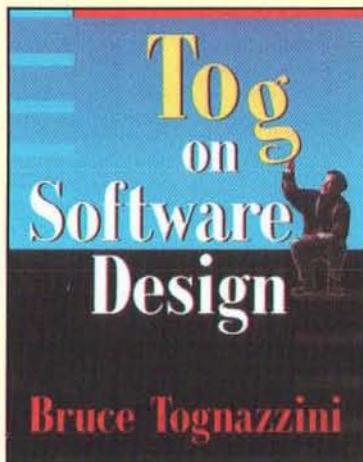
# THE 21ST CENTURY • • •



by Bill Hensler

*Sex, Lies, and Video Games* is written for the wannabe games writer locked inside every Mac programmer. This book provides a learn-by-example tutorial on the ins and outs of Mac arcade-style game programming in C. It teaches game programming lore, including basic game theory, sprite animation, sound, and interaction techniques. This book is a must-read for serious programmers and hobbyists alike.

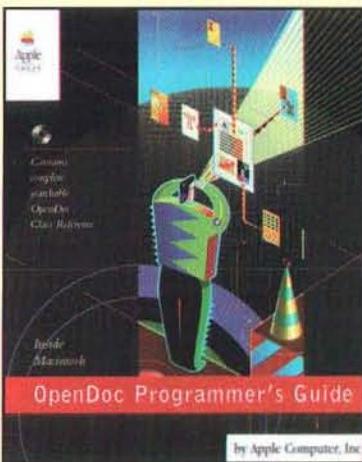
Book/disk, 496 pages



by Bruce Tognazzini

Respected industry futurist, Bruce "Tog" Tognazzini, presents his vision of our technological future, detailing the steps computer professionals need to take to deliver new technologies that will profit the industry and benefit society in general. This book contains Tog's insights on a wide range of topics from quality management to the meaning of standards, and responses to queries supplied by designers and developers.

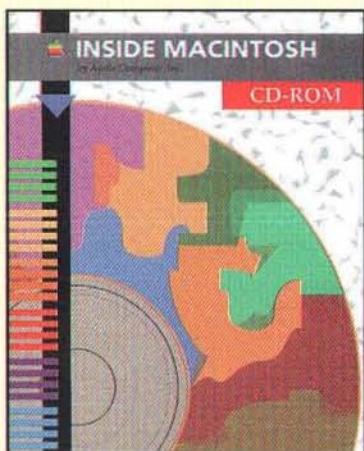
432 pages



by Apple Computer, Inc.

This is the official reference for the implementation of OpenDoc on the Mac OS. The book describes the component software revolution and explains how to develop for it on the Mac OS platform. An accompanying CD-ROM contains a complete reference to the OpenDoc programming interface, and an extensive collection of tested, reusable sample code.

Book/CD-ROM, 688 pages



by Apple Computer, Inc.

Now the 25-book *Inside Macintosh* series is available on one CD. *Inside Macintosh CD-ROM* contains the electronic text for 25 books from *Inside Macintosh*—the essential resource for programmers, designers, and engineers. You can have instant access to more than 16,000 pages of information contained in the *Inside Macintosh* suite, including the QuickDraw GX library.

CD-ROM

Also Available:

**APPLE GUIDE COMPLETE**

by Apple Computer, Inc.

Book/CD-ROM, 544 pages

## ORDER THESE BOOKS AND CD'S FROM MACTECH MAIL ORDER STORE NOW!!

Title	Retail Price	MacTech Mail Order Store Special Discounted Price
Mark, Learn C on the Macintosh, Second Edition	\$34.95	\$31.46
Zobkiw, A Fragment of Your Imagination	\$39.95	\$35.96
Apple, Advanced Color Imaging on the Mac OS	\$36.95	\$33.26
Hensler, Sex, Lies, and Video Games	\$34.95	\$31.46
Tognazzini, Tog on Software Design	\$29.95	\$26.96
Apple, OpenDoc Programmer's Guide	\$44.95	\$40.46
Goodman/Hewes, Apple Guide Starter Kit	\$34.95	\$31.46
Wiederspan/Shotton, Plan. and Manag. Web Sites on the Mac	\$39.95	\$35.96
Apple, Mac Programmer's Toolbox CD-ROM	-----	\$99.95
Apple, Inside Macintosh CD-ROM	-----	\$99.95
Apple, Apple Guide Complete	\$39.95	\$35.96

All of the above books and MORE, are listed in the MacTech Mail Order Store at these Special Discounted Prices.

Order by Mail, Telephone, Fax, or E-Mail at the following addresses:



P.O. Box 5200  
Westlake Village, CA 91359-5200  
Voice (805) 494-9797  
Fax (805) 494-9798

AppleLink: MT.CUSTSVC  
CompuServe: 71333,1063  
Internet: custservice@xplain.com  
America Online: MT CUSTSVC  
eWorld: MT.CustSvc

You may use your VISA, MasterCard or American Express; or you may send check or money order (in US funds only). Don't forget to include your name, address and phone number with each order. (California residents only, add 7.25% tax to your order.)

**neoAccess™**  
Cross-Platform Object Database Engine

# Power Too Abundant to Meter

## Powerful

NeoAccess and NeoShare are the most powerful object-oriented database engines available. They display electrifying performance—up to ten times that of competitors. Behind an elegant programming interface is a high performance query engine utilizing extended binary trees and binary search algorithms tuned for short access times, dynamically combined, collapsed, and compressed indices, and object caching for lightning fast access to previously used objects.

## No Runtime Fees

Get the power of NeoAccess and NeoShare, and avoid the expense and administrative hassle of feeding the runtime fees meter. You pay one affordable price no matter how many copies of your application you sell or use.

Now Available!  
Version 4.0

## Cross Platform

Others may promise cross-platform development tools—NeoLogic delivers. NeoAccess is a set of C++ classes designed for use with popular compilers and application frameworks on Windows®, Macintosh®, and Unix™ platforms. Full source code is included so it can even be used with custom frameworks.

## New in NeoAccess Version 4.0

NeoAccess now supports Microsoft Visual C++ 4.0 IDE, MFC 4.0 and the latest version of Metrowerks CodeWarrior. A new stored query class increases speed and flexibility in accessing objects. Inverted indices and full word search capabilities ease working with many-to-many relationships. And all new on-line Hyper-Reference guide, documentation, tutorial, and sample applications get you up to speed quickly and provide a complete set of reference material.



neo•logic  
Now!

<http://www.neologic.com/~neologic/>  
Download the Architectural Overview!

**neoShare™**  
Client/Server Object Database Engine

## Scalable

NeoShare extends the core features of NeoAccess to client/server applications. NeoShare includes the NeoAccess Toolkit and everything you need to create data intensive distributed applications. Its advanced client/server architecture provides shared access to objects by multiple networked clients. Combine client and server functions into a single application or create separate client and server applications. With NeoShare you have complete flexibility in the design of your distributed systems.

## Proven

Thousands of commercial and in-house developers have already found that NeoLogic's technology enabled them to build fast, powerful applications in record time. That's why NeoAccess and NeoShare based applications are already operating on millions of computers. Tap into the power for your next development project!

**neo•logic™**

Powering Development of Object-Oriented Applications  
NeoLogic Systems 1450 Fourth St., Suite 12 V. 510.524.5897  
[neologic@neologic.com](mailto:neologic@neologic.com) Berkeley, CA 94710 F. 510.524.4501

By Don Crabb



## Tomorrow's Developers

I just spent a surprisingly enjoyable two days as a presenter and keynoter at the 10th Annual Illinois Computing Educators conference in Addison, Illinois, outside Chicago. At this conference, today's K-12 educators met to discuss the latest computer software and hardware, the lastest trends in computing pedagogy, the latest methods in computer laboratory management, and the lastest methods for moving their kids onto the Internet and the World Wide Web.

I say "surprisingly enjoyable," because I found myself learning just as much about the state of Illinois K-12 computer education as I taught about the state of current computing technology and programming environments.

I learned that many of today's kids, especially those in grades 7-12, are chomping at the bit to learn the guts of computing, how and why it works, and not just how much fun it can be. These expectations cut across racial and socioeconomic groups. This information counters the widely-reported stereotype that only nerdy white boys from wealthy suburban families are really interested in learning computer programming, computer architecture, computer networking, and software engineering.

What the thousand or so assembled teachers taught me was to forget that perception as they told me one story after another about inner city African-

American, Hispanic, Asian, and other poor minority kids (girls and boys) who stayed after school just to have a bit more time to use meager computer resources. And just how many of these kids were not just computer-doodling, or banging the Internet and WWW for the hell of it. These kids are demanding to be taught how to put computer technology to use for themselves and their families and how to buy into the digital revolution.

And damnit, we're the folks who ought to be stepping up to the task to make it happen.

Despite the best intentions, programs, and efforts of the teachers I talked with, the minority kids just aren't getting the programming training they want and need. Despite the best intentions, programs, and efforts of the school administrators I talked with, the inner city kids just aren't getting the programming training they want and need. Despite the best intentions, programs, and efforts of the corporate donors I talked with, the poor schools just aren't getting the computer and networking resources they want and need. And despite the best intentions, programs, and efforts of the governmental educational chiefs I talked with, the poor, minority, inner city kids are being overtly and covertly locked out of the digital revolution that is reshaping America.

And damnit, we're the folks who ought to be stepping up to the task to help fix these problems.

This is no longer just an educational problem. It's a problem of the future of this country. Computing and digital information processing are the wave of the present *and* the wave of the future. For as long as any prognosticators can see. And if we don't start digitally enfranchising all of our kids now, regardless of their race, or how much money their families make, or what school they go to, we're going to create a caste system worse than any imagined in colonial India under the Raj. We're going to create a country where the haves and the havenots are not defined so much by bucks as by bytes. The digital literati versus the digitally disadvantaged.

And damnit, we're the folks who ought to be stepping up to the task of providing the guidance, the resources, and the

**About Don Crabb** — Don is a contributing editor and columnist for *MacTech*, *MacWEEK*, *MacUSER*, *Mac/Chicago*, *MacToday*, *Win95User*, *ComputerUser*, *The Chicago Sun-Times Features Syndicate*, *The Springfield Union-News*, *PC Magazine*, and about a million other publications. Don welcomes comments at his Internet address: [don\\_crabb@mactech.com](mailto:don_crabb@mactech.com). You can also check out his WWW Home page at <http://www.cs.uchicago.edu/~decc/>.



**Kaleida Labs**



\*Digital Media, Vol. 4, Number 9, Feb. 10, 1995  
©1995 Kaleida Lab., Inc. Kaleida is a joint venture of Apple Computer, Inc. and International Business Machines Corporation. Kaleida, the "K-Man" logo, and ScriptX are trademarks of Kaleida Lab., Inc. PostScript is a trademark of Adobe Systems, Incorporated. Other trademarks, including the Apple logo and the IBM logo are the property of their respective owners.

## "ScriptX unquestionably has the potential to become multimedia's PostScript." —Digital Media\*

### Unquestionably, the Premier Multimedia Platform.

ScriptX allows you to develop for Macintosh, Windows, and OS/2 systems at the same time. And to ship single titles for all.

### Unquestionably Advanced.

With ScriptX you can develop titles impossible to create with other development tools.

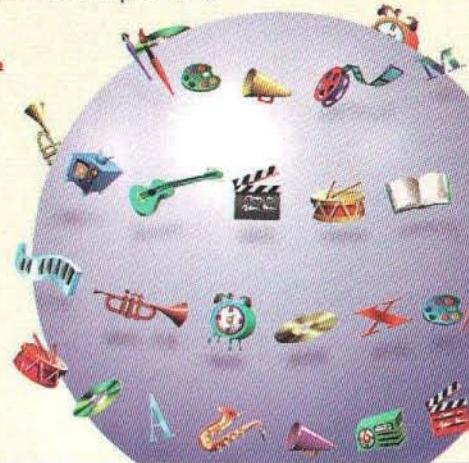
### Unquestionably Reusable.

ScriptX object-oriented design makes it simple to reuse your code. Objects can be perfectly synchronized and are easily moveable, even across the Internet.

### Any Questions?

Call for FREE information, or to buy our ScriptX Language Kit for \$795, with our no-hassle 60-day money back guarantee.

→ **1-800-652-5343**  
<http://www.kaleida.com/>



peoplepower to give our educators the tools and software they need to extend the digital domain to all K-12 students, not just those with the fancy multimedia PowerMac setup in the media room at home.

What I am suggesting here is simple, but executing it will require a real commitment on the part of individuals and their companies. Here we go:

1. Mac developers as a group are among the best programmers on the planet. That's not a boast, it's a fact. Mac hardware and software companies as a group are among the most innovative corporations you can find. That's also not a boast, it's a reality forced on them by a MacOS market that often defies description, and by their primary partner (Apple) that frequently defies logic.
2. Mac developers need a cause to rally around beside defeating Microsoft or learning to be codependent with them.
3. The U.S. is at a crossroads in its ability to provide a proper computing education for all of its schoolage kids.
4. Mac developers and their companies need to get involved supporting K-12 computer education efforts in the U.S., by offering their expertise, pro bono, on how to improve and extend programming and computer engineering curricula; by offering their services, pro bono, at teaching the teachers; by offering their spare time, pro bono, towards creating killer computer pedagogical apps to help the havenots catch up

with the haves; and by offering donations of equipment, networking resources, and software to make all of these initiatives work together.

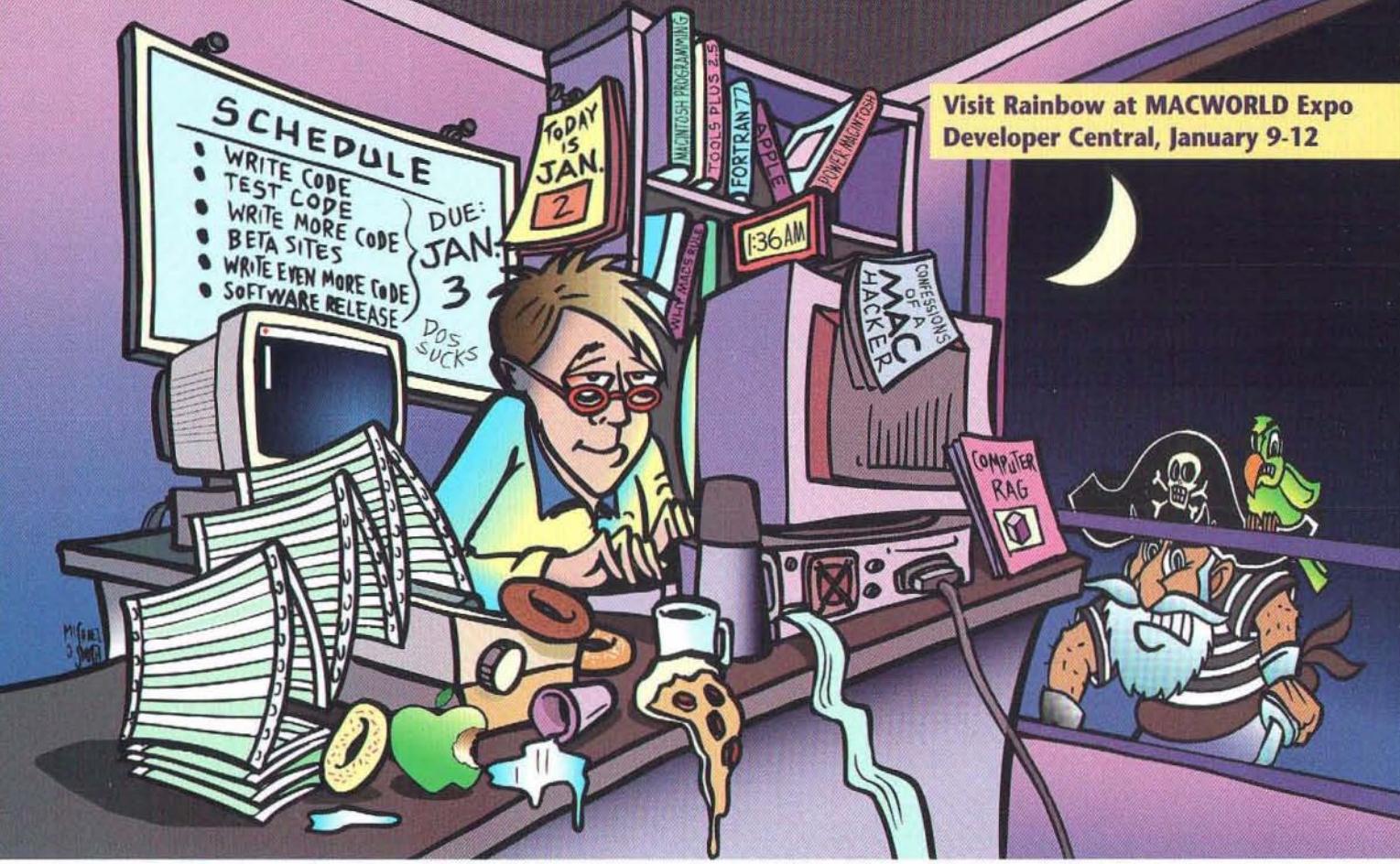
In short, what I am suggesting here is the private equivalent of a Vista or Peace Corps for all American kids revolving around digital technology, with a strong emphasis on programming and software development as keys to understanding how the digital world is working and will work and how to make the most of it. Software and hardware companies would grant paid release time to their developers to work in this program and release time to their managers to establish it, staff it, and get it under way.

Naturally, we'd buttonhole Apple to be the corporate bandwagon upon which we could hitch our pedagogical wagons.

Let's call this new initiative the Digital Corps of America (the idea makes sense in many other countries, too). If you are interested in discussing this concept and want to help organize it, drop me a line at [decc@cs.uchicago.edu](mailto:decc@cs.uchicago.edu). I will try to organize some electronic meeting forum or list to kick things off.

In the long run, with the Digital Corps of America we end up helping to "re-melt the pot" Americans are so fond of thinking represents the American Way, but in a way that makes sense in the Digital Age. And we help firmly establish the very computer markets we are now trying to niche out in our daily struggles by creating a whole new class of computer literate customers. Sounds like a win-win to me.

Visit Rainbow at MACWORLD Expo  
Developer Central, January 9-12



Protect your software investment with *SentinelEve3* – the world's leading protection for Macintosh software.

## You work hard to develop software, don't lose your sales to piracy

Over 8 million *Sentinel*® keys protect software worldwide. In fact, 50% of all protected software has a *Sentinel* key, from Rainbow Technologies.



Stop piracy and ensure your sales with *Sentinel*.

It's the easy way to implement protection that's transparent to your software customers.

Your software and your customers deserve the best protection. Only *Sentinel* keys give you leading-edge security, ISO 9002 certified quality and 99.985% reliability. And only Rainbow can provide products, service and support in over 70 countries.

Find out why leading Macintosh® developers like Adobe®, Apple® and Autodesk® protect with *Sentinel* – call today for a FREE *Sentinel Software*

**Protection Guide.** Or start protection now, order a *Sentinel Developer's Kit* featuring the *Sentinel* CD-ROM. It's everything you need to sell more software and make more money.



**(800) 852-8569**

**SENTEL**  
Software Protection

**RAINBOW**  
TECHNOLOGIES

Visit Rainbow Technologies on the internet at: <http://www.rnbo.com>

WORLD HEADQUARTERS: 50 Technology Drive, Irvine, CA 92718 ■ Tel: (714) 450-7300 ■ Fax: (714) 450-7450  
ASIA/LATIN AMERICA: (714) 450-7300 ■ U.K.: (44) 1932 570066 ■ FRANCE: (33) 1 41 43 2900 ■ GERMANY: (49) 89 32 17 98 0

ARGENTINA: Agri-Aid, S.A. 54 1 8030536  
AUSTRALIA: LOADPLAN 61 3 690 0455  
BELGIUM/LUXEMBURG: F75 37 92 21 11 17  
BRAZIL: MIPS Sistemas Ltda. 55 11 574 8866  
BULGARIA: KSI-METRO 35 92 79 1478  
CHINA (Eastern): Shanghai Pudong Software Park Electronics Company 86 21 4178628  
CHINA (Northern): CS86 80 2173640

COLOMBIA: Construdata 57 1 610 7500  
CZECH REPUBLIC: ZEDAN Int'l 47 2 3103 652  
EGYPT: ZEDAN-ADS 202 248 8994  
GREECE: Byte Computer S.A. 301 924 17 28  
HONG KONG: Computers & Peripherals 852 7515 0018  
HUNGARY: Polyware Kft 36 76 481 236  
INDONESIA: Promtrade Infoscan 62 21 375 166  
IRAN: GAM Electronics 98 21 205 5750

ITALY: BFI IBEXSA SPA 39 23 31 00535  
ITALY: Siosistemi 39 30 24 21074  
JAPAN: Giken Shoji Co., Ltd. 81 52 972 6544  
JORDAN: CDG Engineering 96 26 863 861  
KOREA: Genesis Technologies 82 2 578 3528  
LEBANON: National Group Consultants 961 1 94311  
MALAYSIA: Eastern Sys. Design (M) Sdn Bhd 60 3 341 1188  
MEXICO: Impex Comp., S.A. de C.V. 52 66 210 291

MOROCCO: Futur & Soft 212 2 40 03 97  
NETHERLANDS: IntroCom 31 74 2430105  
PHILIPPINES: Manisoft Ich. Corp. 63 2 813 4162  
POLAND: HITFX Sp. z o.o. 48 22 11 97 51  
PORTUGAL: COMELTA 351 1 941 65 07  
SAUDI ARABIA: ZEDAN 966 2 665 1904  
SCANDINAVIA: Perico A/S 47 2249 1500  
SINGAPORE: Systems Design PTE LTD 65 747 2266

SPAIN: MECCO 34 3 422 7700  
SWITZERLAND: IBM AG 41 1 745 92 92  
SWITZERLAND: Safe Compaq S.A. 41 7401 5386  
TAIWAN: EverShine Tech. 886 2 8208925  
THAILAND: BCS Int'l 66 2 319 4451  
TUNISIA: ASCI 2 16 1 781 751  
TURKEY: BIMERS, Ltd. 98 216 348 3508  
VENEZUELA: HRM Users 58 2 261 4282

©1995 Rainbow Technologies, Inc. *Sentinel* is a registered trademark of Rainbow Technologies. All other product and company names are trademarks of their respective owners.

# Developer Central™

Sponsored by



and



**Macworld Expo/San Francisco • January 9–12, 1996**  
Moscone Convention Center

**Come to the Center of the Universe!**  
(*The Macintosh development universe.*)

If you are developing custom applications, custom solutions, multimedia, or engineering solutions for the Macintosh, then you need to visit Developer Central. Here – all in one place – you will see the latest tools for Macintosh and Newton development. In addition, Apple Computer will be available with information on its training and programs to support developers.

If you want to jump-start your knowledge of Macintosh development or come up to speed on a new technology or tool, then visit the Developer Central Theater, where representatives of Apple's Developer University and others will be presenting the inside scoop on Macintosh development.

## At Developer Central, you can...

- Talk to representatives and demo products from a number of Third Party Vendors
  - Attend sessions in the Developer Central Theater
  - Get the best deals on tools from APDA and MacTech

So, no matter if you are corporate developer putting together a departmental system,  
use the Macintosh in science,  
or are aiming to have the next great Macintosh application or multimedia title,  
*you will find what you need at Developer Central.*

**Developer Central  
The Source for Macintosh Development**

Sponsored by Apple Computer, Inc. and MacTech Magazine

By Peter Potrebic and Steve Horowitz, Be Inc.



# Opening the BeBox

## *A programmer's introduction to the Be operating system*

### INTRODUCTION

Be, Inc. was founded in 1990 by Jean-Louis Gassée, former president of Apple Products, to design and build a new computing platform. The first product offered by the company is a multiprocessing computer called the BeBox. It contains two PowerPC 603 processors and a new, modern operating system.

This article will describe some of the philosophy behind the design of the BeBox. It will go into some detail explaining the system software architecture with an overview of the key components. The article also includes source code and a description of a sample application, to give you a feel for writing software on the BeBox. For more detailed information on Be and the BeBox, as well as a look at developer documentation, please visit our web site: <http://www.be.com>.

### DESIGN PHILOSOPHY

The BeBox was designed with the technology enthusiast in mind. As Jean-Louis is fond of saying, "Only the lunatic fringe will lead us to the truly innovative applications." Every machine is programmable right out of the box, and comes bundled with programming tools from Metrowerks and full developer documentation. We do not expect that the BeBox will be your first computer – it will not run any Macintosh software nor will it run Windows. However, if you are excited by new technology, know how to write code, and have a pioneering spirit, the BeBox may have something to offer you. See Figure 1 for a screenshot showing a few running Be applications.

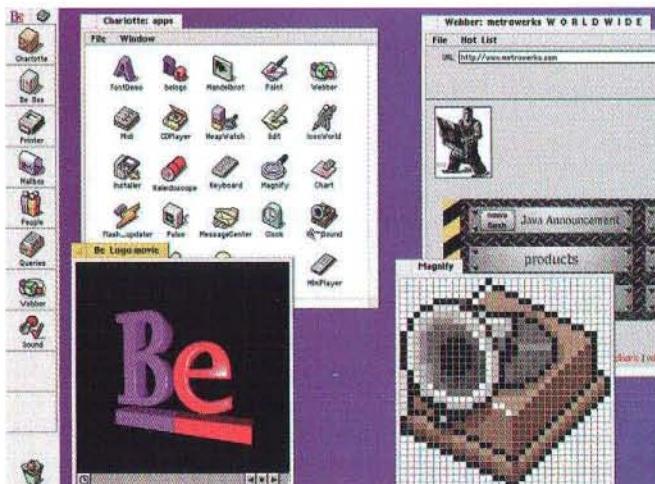


Figure 1. Sample screen shot

**Peter Potrebic and Steve Horowitz** – When not out riding one of his bicycles up a really big hill, Peter Potrebic is a happy software engineer at Be Inc. He's worked at Be for the past year and a half. Before coming to Be, Peter spent eight years at Apple Computer engineering software for Newton, NTK, and MPW. Steve Horowitz is a software engineer at Be Inc. When not giving demos at Be he can generally be found chasing pucks around ice rinks or watching others do the same. Having worked at Be for four years, Steve has finally given up hope of being called up by the Sharks. Prior to Be, Steve worked at Apple Computer for two years as an engineer and four summers as an intern.

History has shown that it is difficult to predict the markets where a new computer might be successful. We believe that developers will lead us, and so our goal is to provide a unique set of system software features, a low-cost hardware platform, great development tools, and an extensive developer support program. Additionally, we plan to help our developers reach their potential customers by offering electronic distribution of their software on the Be web site. From all of this we hope to see new and innovative applications for markets we could not possibly envision.

The BeBox was designed by an extremely small team over approximately four years. We started with a clean slate and focused on a couple of key ideas. One of the fundamental design techniques was to give responsibility for each major system component to one person. By concentrating the decision-making process, the engineers were allowed a great deal of freedom without having to justify and get consensus for every design decision. However, since most of the components were interrelated there was enough informal interaction to assure that we were all on the same track. This approach allowed us to avoid some of the pitfalls of overdesign and resulted in what we believe is a simple, efficient, and fast set of system software components.

Another decision we made early on was to take a C++ light approach. We wanted to use an object-oriented programming language, but not necessarily to use every feature the language had to offer. Programmers need not be C++ experts to program the BeBox. This decision makes the system more approachable by a larger number of people with a variety of programming experiences. It is also fairly easy to absorb the Be class libraries and get a simple Be application up and running quickly.

#### SYSTEM SOFTWARE OVERVIEW

The design of the Be operating system is based around a client/server architecture, with a microkernel at the lowest level providing all the OS functionality used by the higher levels. The developer makes use of a set of client-side C++ class libraries and C functions to write Be applications.

The system software consists of a number of key components. Several servers are built on top of the kernel including an application server, storage server, network server, and media server. The servers run in separate protected memory areas and implement the majority of system functionality available from the C++ class libraries. The class libraries are broken up into a series of kits which export the functionality from the servers to the client applications. Among the kits available to Be applications are an application kit, interface kit, OS kit, device kit, media kit, midi kit, networking kit, and storage kit. The details of all of these kits are beyond the scope of this article. Instead, this article provides a brief summary of each server's basic functionality, followed by a description of the major pieces in a simple Be application.

The Be kernel provides many fundamental system services

to the higher-level servers including the ability to deal with multiple processors, true preemptive multitasking and multithreading, memory protection, shared memory, semaphores, virtual memory, shared libraries, and loadable drivers. The kernel scheduler supports multiple processors in a manner completely transparent to the application. This and other features of the kernel provide an extremely fast and efficient foundation upon which the rest of the operating system is built.

The application server is the main server with which applications communicate. It is in charge of all the window and view management, graphics rendering, font management, user interface interaction, event handling, and so on. One important aspect of the Be programming model implemented by the application server and interface kit is that every window in the Be system is given two separate threads. The application server maintains a thread on the server side, which communicates with a client-side thread running in the application's address space. This allows all windows to update their contents and respond to user interaction asynchronously, and is a major factor in the overall responsiveness of the Be system. This also means that any multiwindowed Be application is automatically multithreaded and multiprocessing with little work from the developer. You can, of course, spawn more threads for your application using other classes in the application framework or the lower-level kernel functions.

Another important server is the storage server. It implements the built-in database functionality in the Be operating system. The storage server allows programmers to design tables that describe records, create and delete records, and receive notification of database changes. With the integrated database, every file on the BeBox has its own database record. This acts as an extensible storage system, allowing programmers to create unique tables containing whatever information they want about a file. The fields in these records (as defined by the table) are then searchable and viewable by all applications in the system. Additionally, the storage server implements a "live" query mechanism that allows any Be application to construct a query and then, if desired, get notified continuously of any changes to the set of records located by the query. This behavior is seen in the system Browser (an application akin to the Macintosh Finder) which is part of the operating system, but this service is available to all Be applications.

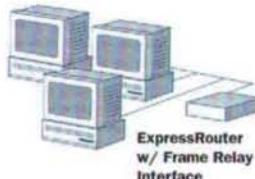
The network server provides basic system networking services. It implements the TCP/IP protocol stack and provides a socket interface resembling Berkeley sockets. There is also a PPP layer included in the server, and support for Ethernet. Standard networking tools such as ftp, ftpd, and telnet are included with the Be system.

The media server provides a set of tools for manipulating large streams of multimedia data. This server handles the transportation of buffers of media data through a pipeline of interested data handlers. Each handler can subscribe to a

# Fast remote internetworking in a *single* box.

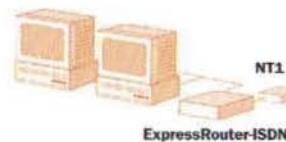
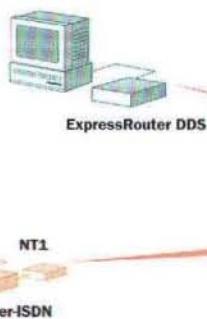
## ► E-mail

Streamline communications with enterprise-wide E-mail.



## ► Telecommuting

High speed access to the entire office network.



## ► Videoconferencing

Close the gap between distant sites with LAN-to-LAN videoconferencing.

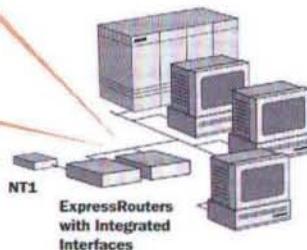
## ► Shared Access to the Internet

Your whole department or organization can connect to the Internet—full time or just when you need to.



## ► Centralized Databases

Access or update information from any point on your Wide Area Network.



## ► Fast File Transfer

Transfer files at speeds up to 1.544Mbps—10 MB per minute.

What makes the ExpressRouter the best choice for your Wide Area Network (WAN) needs?

- Built-in WAN interfaces for Frame Relay, ISDN, T1, and 56Kbps DDS.
- Expandable architecture that supports up to 3 high-speed WAN ports.
- Built-in support for AppleTalk, TCP/IP and Novell IPX LAN protocols.
- Interoperability via PPP.
- Support for SNMP and Telnet management standards.
- Powerful, easy-to-use auto-dialer software designed for the Macintosh.



**Engage Communication, Inc.**

9053 Soquel Drive • Aptos, CA • 95003

Tel: 408.688.1021 • Fax: 408.688.1421 • E-mail: sales@engage.com • WWW: www.engage.com

## Get Net Wise... NOW!

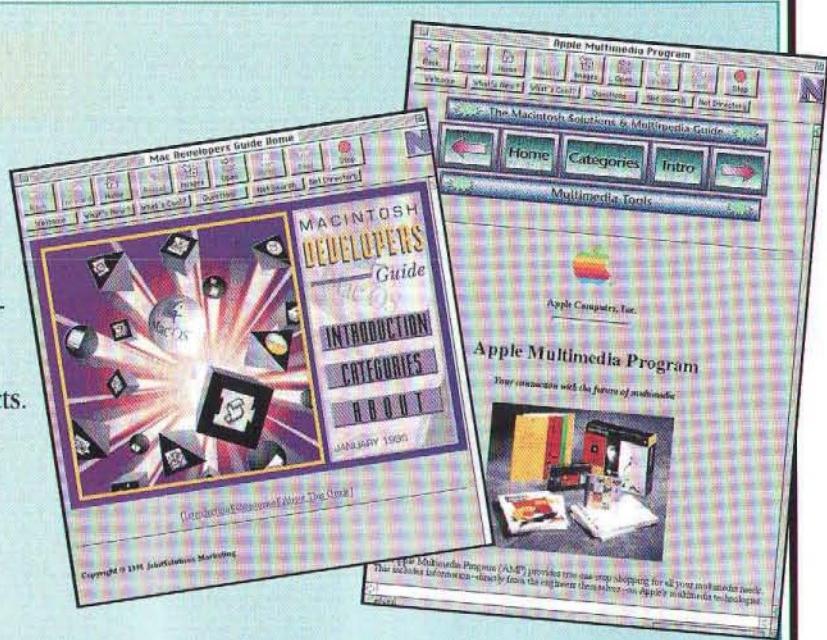
JointSolutions Marketing is now creating exciting World Wide Web pages for various clients, including Apple Computer, Inc.

We can also assist you with all aspects of database publishing and interface design.

Call for the Web addresses of our latest projects.

**Don't miss this opportunity to reach your target audience. Call today!**

- **Web Page Design**
- **html Conversion**
- **Button and Screen Design**
- **Interface Design**
- **Database Publishing**
- **Project Management**



**JointSolutions Marketing**

408/338-6471

408/338-6475 (fax)

jsolver@aol.com (e-mail)



media stream. By subscribing, the handler is given a chance to manipulate or read the data as it passes through the system. The buffers are implemented as shared memory areas, which can be read by multiple applications in separate address spaces without having to copy the buffers between applications. Additionally, you can use the media server to synchronize separate media streams, using a global scheduling object that allows easy coordination of audio and video data.

### BE APPLICATION BASICS

A simple Be application will primarily make use of the features in the application kit and the interface kit. The core objects used by an application are BApplication, BWindow, BView, BMessage, and BLooper. BLooper (feel free to call it "blooper") is the main object used to encapsulate thread spawning and message handling. Each BLooper object has its own thread that responds to messages sent to it by other objects. Since BApplication and BWindow both inherit from BLooper they are automatically message handlers running in their own threads.

Generally, a BApplication object is created first. It runs an event loop in the main thread of the application, and is used for basic messaging between applications. It can also be used to exchange messages with windows or other threads in your

application. Additionally, the BApplication object receives notification of files to open at launch time or once the application is running. The BApplication object is the central control object from which other windows and objects are created and can be used to synchronize sharing of global objects within an application.

Most of the communication between threads, windows, and applications in the Be system is done using a BMessage object. A BMessage has the ability to contain an arbitrary number of "data" entries to pass information around, as well as a "what" field to tell the receiver what type of message it is receiving. BMessages are the fundamental objects used to share information between threads and applications. They are also used to implement drag-and-drop and the clipboard.

To actually display anything in your application, you must create a BWindow object and add a BView to it. Each window you create, by virtue of its BLooper inheritance, will spawn a new thread to handle drawing, messaging, and user interaction – without monopolizing your application's main thread. Windows are also the containers of BView objects, and handle the display of any drawing that takes place in a view. A BWindow can contain multiple views and, in turn, views can contain other views. Each view has its own drawing environment and all drawing is automatically clipped to the

# Take a Power Trip to a New Realm of Developing

## Powerful Tools to Take You Where You Want to Go

You've heard about the speed of PowerPC™ and you're thinking about the cool applications and content this amazing new chip will allow you to create. Read on to learn more about the tools that will take your development where you want to go, fast.

**Prototyping** HyperCard® 2.3 provides a robust prototyping and development environment for professional developers. It is also an easy-to-use tool for building a wide range of custom software applications for Macintosh®, from training simulations to information kiosks. And now it's accelerated for Power Macintosh®.

**PowerPC and 68K Compilers** Metrowerks CodeWarrior Gold is the industry's first native development environment for both the PowerPC and 68K-based Macintosh environments. You can easily target the entire Macintosh installed base with code created using one development environment running at Power Macintosh speeds.

**Cross-Platform Multimedia** Create innovative, interactive multimedia titles which will play on both Mac OS and Windows systems. Give users the ability to cruise up, down and around objects. They can even zoom in and pick them up. No wonder QuickTime® VR Authoring Tools Suite v1.0 has won so many awards, including MacUser Magazine's "Eddy" for Breakthrough Technology of the Year.

There's a wide variety of development tools available through the Apple Developer Tools Catalog. Check it out. Developing on the Macintosh platform has never been easier or faster. And now with cross-platform flexibility, it's smarter than ever.

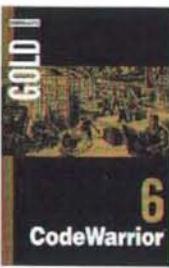
### Metrowerks CodeWarrior Gold

A complete development solution for C/C++ and Pascal programming.

\$399

Runs native and cross-compiles on 68K or PowerPC platforms, ensuring that as you go forward on Power Macintosh you also conserve your investment in your installed code base on 68K Macintosh and your code base

remains backward-compatible. Lets you compile, link, and debug 68K software at full native speed on a PowerMac®, and build PowerPC versions of your software on a 68K Mac.



### How to Order

To order call:

1 800 282-2732

And ask for a free copy of the Apple Developer Tools Catalog.  
Visa, MasterCard and AMEX accepted.

### HyperCard 2.3

A robust prototyping and development environment accelerated for Power Macintosh

\$99

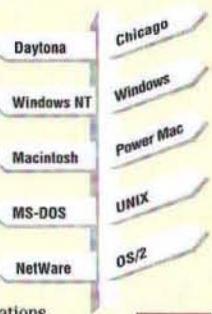
Comes with powerful scripting tools including AppleScript® Runtime built-in, a modeless script editor, hypertext support, debugging tools, new 24-bit color painting tools, Automated Button Tasks, and many other features. Stacks can be saved as stand alone, double-clickable applications you may distribute without software royalty fees.



## WHETHER YOU'RE HEADED TO CHICAGO, DAYTONA, OR POINTS UNKNOWN, BASICSCRIPT HELPS YOU ARRIVE IN STYLE.

The BasicScript Toolkit makes it easy and economical to add an award-winning scripting language to your application.

- Easy-to-use APIs make it simple to integrate BasicScript into your application using C, C++, or other tools.
- Compatible with the syntax of Microsoft Visual Basic and Visual Basic for Applications (VBA).
- Controls OLE Automation objects in Macintosh, Windows, and Windows NT applications.
- Extensibility architecture allows you to add your own keywords to the BasicScript language.
- Available for Macintosh, Power Macintosh, Windows 3.1, Windows 95 "Chicago", Windows NT 3.5 "Daytona", MS-DOS, SunOS, Solaris 2.x, HP-UX, AIX, IRIX, UnixWare, SCO UNIX, Ultrix, OSF/1, Open VMS, NetWare, and OS/2.
- Runtime can be redistributed by your customer without royalties.
- Free technical support, comprehensive documentation, and numerous code samples keep your engineering costs to a minimum.
- Licensed by Symantec, Delrina, and more than three dozen other leading companies. Named *PC Magazine* Editors' Choice among cross-application macro languages.
- Flexible licensing terms mean you can afford the finest scripting language on the market today.



CALL TODAY FOR YOUR FREE  
EVALUATION COPY, 315 445.9000

Summit Software Company   Fax: 315 445.9567   Internet: info@summssoft.com  
CIS: 71211.3504   WWW: http://www.summssoft.com

bounds of the view. When a window needs updating, it calls the virtual Draw() function for all the views in the update region. Within Draw() other functions are used to render graphics primitives, such as bitmaps, lines, shapes, and strings. Most of the user interface components in the Be system such as buttons, scrollbars, menus, and others are derived from BView, and handle drawing and mouse events automatically.

There are many more classes in the Be application framework available to developers. The ones described above are simply the most fundamental to a Be application. They provide the basic functionality for an application that wants to launch and put up a window to do some drawing. Since the entire Be operating system is relatively small, it is easy for one person to understand it all. It is also easy to learn and to get an application up and running quickly in the Be environment.

### THE BOUNCING BALL

Now let's cut to the chase and explore a sample application. It seems that every new computer platform comes with a bouncing-ball demo. Each platform uses this application to show something particular or unique about itself. The bouncing-ball demo on the BeBox, called BeBounce, builds on this tradition – and adds a unique twist.

The BeBounce application opens a small window that contains a single bouncing ball. The twist is that launching a

second instance of the application opens a "gap" between the windows, the size and location being determined by their relative positions, and the ball is then able to bounce between the two "partner" applications. As either window is moved around the screen, the gap between the windows follows the motion, growing larger or smaller and moving around each window frame as dictated by Euclid (i.e. by geometry). See Figure 2. If the ball happens to enter the gap it is magically teleported to the other application.

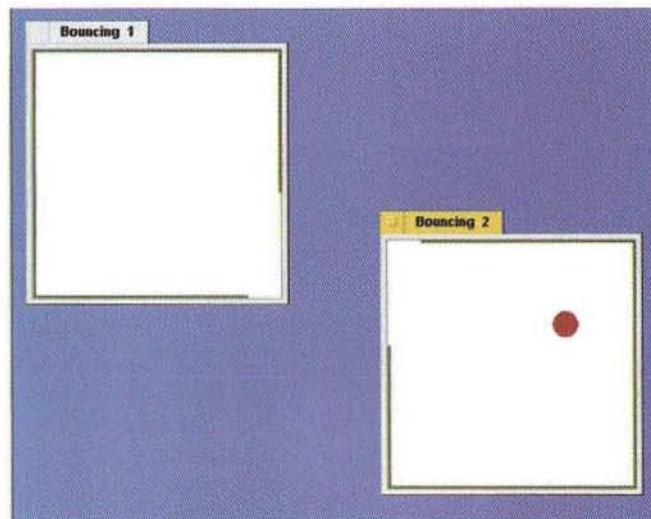


Figure 2. The BeBounce application

In addition to showing some basic Interface Kit techniques, the BeBounce application demonstrates the straightforward way in which applications can communicate. As explained earlier, each Be application runs in its own address space and each window runs in a separate thread. Additionally, each application has a "main thread" represented by a BApplication object. The multithreaded nature of an application is inherited from the BLooper class. BLooper objects execute a message handling loop which responds to messages posted to the looper using its PostMessage function. The looper then dispatches those messages, in sequence, to the "target" BReceiver object by calling the virtual MessageReceived function. Note that BLooper is a kind of BReceiver so a looper can also receive messages.

The BeBounce application consists mainly of one object derived from BApplication (TBounceApp), one object derived from BWindow (TWindow), one BMessenger object, and one object derived directly from BLooper (TBall). In the Be system, BMessage objects can be sent around within an application. However, to send messages between applications a BMessenger object is needed. The messenger object is a one-way connection between two applications. In BeBounce, when the ball enters the gap a message is sent to the partner using the messenger object, literally passing the ball to the partner.

# If you have a CD-ROM drive, then you've gotta have every article published in the first **10** years of **MacTech Magazine!!**

Available  
Now!!

... now in **THINK Reference** format!

## **MacTech CD -ROM, Volumes 1-10:**

**Over 1230 Articles.  
All 115 Issues,  
including all of 1994.  
All the Source Code.  
THINK Reference 2.0.  
Working Applications.  
Full Documentation.  
Demos for Developers.  
And More!!**

"When I designed THINK Reference, I envisioned endless databases at my fingertips. MacTech has doubled the information that is just a mouse click away."

— Darrell LeBlanc, Formerly of Symantec,  
Author, THINK Reference 2.0

"The CD strikes me as an impressive and very useful resource. The only disadvantage I've found is that each answer the databases yield exposes me to so many more issues, that I find myself exploring the articles for the sheer wonder of it, and thus putting off the real coding I should be doing. :-)"

— Nicholas De Mello  
MacTech CD Beta Tester

For Macintosh  
Programmers & Developers



Voice: 805/494-9797 • Fax: 805/494-9798

Internet: custservice@xplain.com

eWorld: MT.CustSvc • AppleLink: MT.CUSTSVC  
CompuServe: 71333,1063

America Online & GEnie: MACTECHMAG

### ✓ **50 MB of MacTech Magazine articles, Volumes 1-10**

Every article, 1230+ of them, from all 115 issues of MacTech Magazine printed from 1984 through 1994. Articles ranging from Assembly to BASIC, C to Pascal, Forth to FORTRAN and more. *And the articles are in THINK Reference!*

### ✓ **Hyperlinks to Inside Macintosh Databases of THINK Reference**

The articles have hyperlinks to relevant portions of the *Inside Macintosh* databases of THINK Reference. For example, if you are looking for information on Aliases, look at the MacTech articles on Aliases and use the hyperlinks to jump to the *Inside Macintosh* entry for the Alias Manager. And now, with the articles in THINK Reference, you can do free-text searches 8-10 times faster than you could previously with On Location™ 2.0.

### ✓ **100+ MB of MacTech Magazine source code examples, samples, and utilities.**

These are the files that go with the magazine – the code that the articles are talking about. Use them in your own applications, with no royalties!

### ✓ **A fully-capable version of THINK Reference**

Including *Inside Macintosh* Volumes 1-6 (7 MB).

### ✓ **Sprocket – MacTech's Tiny Framework.**

Build your simple application using a lean, mean application framework. Experiment with new code without having to build a whole application around it!

### ✓ **80 MB of FrameWorks, MacApp®, MADA and SFA articles, files and source code.**

The most complete set of FrameWorks archives known.

### ✓ **Apple APIs, Utilities, and SDKs**

Including: Universal Header Files, Discipline, Macintosh Drag and Drop SDK, MacsBug, Telephone Manager SDK, Thread Manager SDK, TrueEdit 1.8 and more.

### ✓ **Ariel Publishing's Inside BASIC on disk**

...and other related BASIC programming information and tools.

### ✓ **75 MB of Special Demos relevant for developers**

## **FREE! THINK™ Reference**

Symantec's THINK Reference 2.0. Complete on-line guide to Inside Macintosh, Vol. I-VI, with cross referenced index, detailed information of each function, procedure and detail needed when programming the Macintosh.

**SYMANTEC.™**

### **MacTech CD-ROM, Volumes 1-10:**

\$49 plus shipping and handling. \$39 plus shipping and handling for upgrades from any previous version of the CD.



## Share your vision—and your workload

with an understanding, creative partner who can expedite all or part of the development

process for you. The SU5 Group has a track record of creating quality products, ready to publish and market.

*Making Your Ideas Come Alive*

PHONE: 817 / 870-2557  
INTERNET: [sufive@onramp.net](mailto:sufive@onramp.net)  
WORLD WIDE WEB: <http://www.rahul.net/sufive/>



### MACINTOSH SOFTWARE DEVELOPMENT

Let's take a look at some code, starting with the `main()` function:

```
main(int argc, char* argv[])
{
    // to randomize the movement of the bouncing ball
    srand((long) sys_time());

    // make the new application object and start it running
    my_app = new TBounceApp();
    my_app->Run();

    // application is finished so cleanup and return
    delete my_app;
    return 0;
}
```

The basic idea is to create the application object and start it running. The `Run()` function returns when the application quits. The `TBounceApp` object is then deleted and the program returns. Most applications on the BeBox will have a similar `main()` function.

#### The application object

The `BApplication` object is the real launching point for most applications, and BeBounce is no exception. Here is the definition of the `TBounceApp` class:

```
class TBounceApp : public BApplication {
public:
    TBounceApp();
    ~TBounceApp();

protected:
    virtual void MessageReceived(BMessage *msg);
    virtual void InitPartner(thread_id tid);
    virtual void RemovePartner();
    virtual bool SendToPartner(BMessage *msg);
    virtual void SendPosition(BRect rect);

private:
    TWindow *fWindow;
    BMessenger *fPartner;
};
```

The application constructor does several interesting things. First, when the application is launched it needs to determine how many instances of the BeBounce application are already running. Here is a portion of that function:

```
TBounceApp::TBounceApp()
: BApplication(MY_SIGNATURE)
{
    ... // some initialization code

    if (app_count > 2) {
        // only support 2 applications at a time
        PostMessage(QUIT_REQUESTED);
        return;
    }

    ... // more initialization to be discussed below
}
```

The above code uses the `be_roster` (aka "rooster") object, a system-wide object that, among other things, maintains information on all running applications. The roster returns a list of all running applications that have the signature `MY_SIGNATURE`. If there are more than two instances of the application already running, this instance simply quits.

If this is the first instance of the application it simply creates the window:

```
if (app_count == 1) {
    // The first instance of BeBounce will have a ball.
    fWindow = new TWindow(wpos, "Bouncing 1", TRUE);
} else {
    ... // the second instance of BeBounce
}
```

If there are two instances, things are trickier:

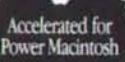
```
if (app_count == 1) {
    ... // the first instance of BeBounce
} else {
    // This is the second instance of the BeBounce app
    fWindow = new TWindow(wpos, "Bouncing 2", FALSE);
}

// determine which of the 2 instances is myself and which is the partner!
initPartner(tid);
```



# KILL YOUR BUGS BEFORE THEY KILL YOUR SCHEDULE!

**TMON**



PROFESSIONAL SYMBOLIC DEBUGGER



[www.mindvision.com](http://www.mindvision.com)  
tel (402) 477-3269  
fax (402) 477-1395

```
/* Send the introductory message along with my thread
id and location in screen coordinates.*/
BMessage *msg = new BMessage(BB_HELLO);
msg->AddLong("thread", Thread());
msg->AddRect("rect", wpos);
SendToPartner(msg);
```

Here, as before, the application creates the window. It then determines the thread id of its partner application and initializes a BMessenger object for communicating with the partner. The code that creates the messenger is in the utility member function TBounceApp::InitPartner():

```
void TBounceApp::InitPartner(thread_id tid)
{
    if (fPartner) // BB_HELLO race condition
        return;

    // establish a 'messenger' as the link to our partner
    fPartner = new BMessenger(MY_SIG, tid);
    if (fPartner >Error() != NO_ERROR)
        delete fPartner;
    fPartner = NULL;
}
```

It is important to note that this function handles the race condition surrounding the BB\_HELLO message. Imagine launching two instances of BeBounce at the same time. The call to GetThreadList() could return two instances to each

application. In this case both applications will behave as the second instance and both will send BB\_HELLO messages. This will result in TBounceApp::InitPartner being called twice by each application. In this particular application the only result would be a small memory leak of the first BMessenger object. Understanding these types of race conditions is one of the critical aspects of designing software for the BeBox. Note that the code does not handle three applications launching simultaneously. In this case all three applications might decide that they are the "third wheel" and quit.

After creating the messenger, the code constructs a BB\_HELLO BMessage object. The next step is to add the thread id of this application to the message. The other application uses this data to construct its own BMessenger. The window position is also added to the message so that the partner knows this window's initial position. The message is sent using the utility function TBounceApp::SendToPartner. Other than error handling SendToPartner contains just one line:

```
bool TBounceApp::SendToPartner(BMessage *msg)
{
    ... // error handling
    fPartner->SendMessage(msg);
    ... // error handling
}
```

The final steps of the constructor are to create a "Stop Ball" menu item and show the window on screen:

```
// inside the TBounceApp constructor
/*
A little bit of menu code. Add a 'Stop Ball' menu item to the application menu
(found in the Dock window) By default items in the "app" menu post messages to
the application. In this case the message should be "targeted" to the window, not
the app.
*/
BPopupMenu *menu = AppMenu();
BMenuItem *item = new BMenuItem("Stop Ball",
    new BMessage(BB_STOP), 'K');
item->SetTarget(fWindow);
menu->AddItem(item);

fWindow->Show();
// this is the end of the TBounceApp constructor
```

The protocol that the applications use to communicate with each other is most apparent in the `TBounceApp::MessageReceived()` member function:

```
void TBounceApp::MessageReceived(BMessage *msg)
{
    switch (msg->what) {
        case BB_HELLO:
            ... // a second BeBounce application is saying hello!
            break;
        case BB_GOODBYE:
            ... // our partner is quitting
            break;
        case BB_WINDOW_MOVED:
            ... // partner moved, and has given us its new position
            break;
        case BB_BALL:
            ... // we've just been given the ball
            break;
    }
}
```

Receiving a `BB_HELLO` message means that a second instance of the application is introducing itself. Here is the code for handling this message:

```
case BB_HELLO:
    if (fWindow->Lock()) {
        /*
        A new instance of BeBounce was just launched
        and sent us the introductory message.
        */
        InitPartner(msg->FindLong("thread"));

        // Initialize our partner's current location.
        pos = msg->FindRect("rect");
        fWindow->PartnerMoved(pos);

        // Tell our new partner our current location.
        pos = fWindow->Frame();
        SendPosition(pos);
        fWindow->Unlock();
    }
    break;
```

This code initializes a `BMessenger` using `TBounceApp::InitPartner()` and places the thread id in the message. The partner's window position is also retrieved from the message and saved. Finally the code determines the position of its window and sends that to the partner. The communication link between the two applications is now open.

The next message is `BB_GOODBYE`. This message is sent as BeBounce applications quit. The code for responding to this message is quite simple:

```
case BB_GOODBYE:
    if (fWindow->Lock()) {
        /*
        Our partner is quitting.
        RemovePartner();
        if (msg->HasBool("ball"))
            fWindow->AddBall();
        fWindow->Unlock();
    }
    break;
```

The partner is removed using the function `TBounceApp::RemovePartner`, the complement of the `InitPartner` function seen earlier. In addition, if the quitting partner currently had the ball a new ball is added to this application's window. This ensures that there is always a bouncing ball. The code that sends the `BB_GOODBYE` message is described in the section on the window.

The final two messages sent between the applications, `BB_WINDOW_MOVED` and `BB_BALL`, are status messages informing the partner that either the window moved or the ball has moved through the gap. Here is the code, without further explanation:

```
case BB_WINDOW_MOVED:
    /*
    Our partner is informing us that it moved. This message is continually
    generated as the other window is being moved. TWindow::PartnerMoved
    redraws the window to reflect the new position.
    */
    if (fWindow->Lock()) {
        pos = msg->FindRect("rect");
        fWindow->PartnerMoved(pos);
        fWindow->Unlock();
    }
    break;

case BB_BALL:
    /*
    Our partner just passed us the ball.
    */
    if (fWindow->Lock()) {
        BPoint speed = msg->FindPoint("speed");
        float rel_loc = msg->FindFloat("rel_loc");
        fWindow->AddBall(rel_loc, speed);
        fWindow->Unlock();
    }
    break;
```

## The window object

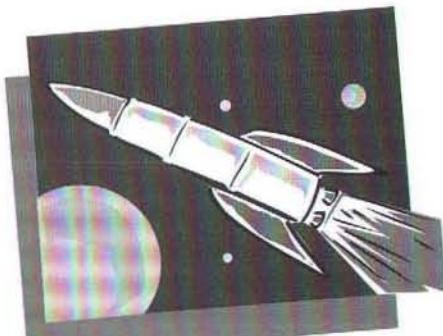
The next class of interest is `TWindow`, a subclass of `BWindow`. In the BeBounce application the window is responsible for managing the ball and for informing the partner application of particular events (see description of `TBounceApp::MessageReceived()` above). The window also presents the UI for this application so there is some description of how applications can create and manage UI on the BeBox. In the Be operating system a `BWindow` object provides an area that can display and retain rendered images. A `BWindow` by itself cannot draw, only `BViews` can draw. However, a `BView` must belong to a window in order to draw. These two classes work hand in hand.

Here is a portion of the `TWindow` class definition:



# dtF

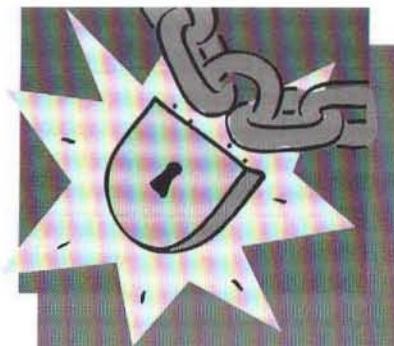
## The Relational Database System



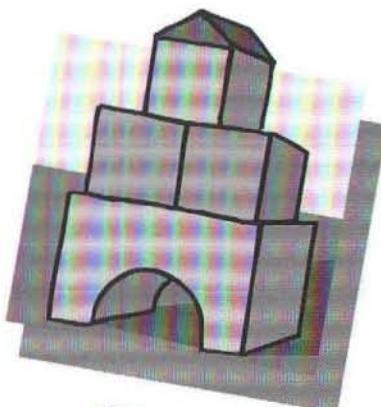
...performance

When it comes to performance **dtF** is in a class all its own. **dtF** utilizes a proprietary query optimization and caching scheme to obtain unparalleled performance. If you are in need of a quantum leap in performance, use the **dtF** native PowerPC stand-alone or client/server version.

**dtF v1.6**  
including numerous  
SQL enhancements  
and ODBC driver  
available!



...data security



...ease of use

**Stand-alone  
applications built with  
**dtF** are royalty-free!**

With **dtF**'s unique direct integration technology, the **dtF** database system is fully contained in your application, enabling you to build double-clickable database applications. Never worry about missing or conflicting INITs or drivers. **dtF**'s native API is compact, easy-to-use and integrates seamlessly with all major development environments on the Macintosh. **dtF**'s high performance SQL, integrated data dictionary, security features, automatic index selection, query optimization and error recovery allow you to concentrate on creating great database applications instead of messing around with the internals of the database system.

**dtF** is available for Macintosh System 7.x (68K and native PowerPC). **dtF** supports MPW C/C++, Symantec C/C++, Metrowerks CodeWarrior (all compilers 68K and native PPC). **dtF** is fully OpenDoc™ compatible. Separate versions for use with HyperCard 2.x, SuperCard 2.x, Smalltalk-Agents and Pictorius Peregrine are provided. AppleScript interface via DataScript™ for **dtF** from General Knowledge. **dtF** supports cross-platform development on Windows 3.11, Windows 95 and OS/2.

### dtF Americas, Inc.

19672 Stevens Creek Blvd.,  
Suite 128  
Cupertino, CA 95014  
USA

Phone: (800) DTF-1790  
Fax: (510) 828-8755  
AppleLink: DTF.AMERICA  
Internet: dtF.america@  
applelink.apple.com



**dtF** The Relational Database System

# PowerTap™

Q: How do you make a Mac run your software  
*10-20 times faster* than it does now?

A: Let it tap into a faster Mac!

If you don't believe it, send for a free test report.  
Better yet, try our demo yourself. You won't believe  
how easy it is either!

- Easy-to-use API
- Robust
- Compatible
- Supports PowerPC, 68K, A4 and Thread Manager software.
- Supports uni- and multi-processor machines.

## Emerson Kennedy



(800) 297-3888

powertap@aol.com

PO Box 2530 • Redmond, WA 98073

```
class TWindow : public BWindow {
public:
    TWindow(BRect frame, const char *title,
             bool with_ball);
    ~TWindow();
virtual void MessageReceived(BMessage *msg);
virtual bool QuitRequested();
virtual void FrameMoved(BPoint new_position);
void AddBall();
void AddBall(float rel_location, BPoint speed);
... // a few more member functions
private:
    void DrawOffScreen(BView *v);
    ... // a couple more private member functions and then
         // some private data members
};
```

The TWindow constructor contains several code fragments worth discussing:

```
TWindow::TWindow(BRect frame, const char *title, bool ball)
: BWindow(frame, title, TITLED_WINDOW, NOT_RESIZABLE)
{
    ... // some initialization removed

    if (ball)
        AddBall();

}
The drawing takes place in the view fOffView that was added to the offscreen
bitmap fBitmap. In this way we'll do the drawing offscreen and then just blit the
result to the screen.
*/
```

```
fBitmap = new BBitmap(b, COLOR_8_BIT, TRUE);
fOffView = new BView(b, "", 0, WILL_DRAW);

fBitmap->Lock();
fBitmap->AddChild(fOffView);
DrawOffScreen(fOffView); // draw the initial contents offscreen
fBitmap->Unlock();

/*
This view is added to the visible window. Its only role is to blit the offscreen
bitmap to the visible window.
*/
fMainView = new TBitmapView(b, fBitmap);
AddChild(fMainView);

... // some initialization removed
}
```

Here is the first look at how windows and views are created and used on the BeBox. To get smooth animation TWindow uses an offscreen bitmap (a BBitmap object) and a basic BView object (fOffView) for the rendering. It is in the context of this view that all the actual drawing occurs. The graphics primitives, like BView::FillRect() and BView::FillArc() that create the effect of a ball bouncing off real walls, takes place in this offscreen view. The last view created, an instance of the TBitmapView class, is simply the helper view that blits the bits from the offscreen bitmap into the onscreen window. Since the TBitmapView class (a subclass of BView) is so simple here is all its code:

```
TBitmapView::TBitmapView(BRect frame, BBitmap *bitmap)
: BView(frame, "", FOLLOW_NONE, WILL_DRAW)
{
    /*
    The only job of this view is to blit the offscreen bits into the onscreen view.
    */
    fBitmap = bitmap;
}

void TBitmapView::Draw(BRect update)
{
    // blit the bitmap with source and dest rectangle 'update'
    DrawBitmap(fBitmap, update, update);
}
```

As stated previously, a BWindow is a kind of BLooper, which in turn is a kind of BReceiver. As such, a window runs in its own message loop and it can receive messages. A BView is also a kind of BReceiver so it too can receive messages. A message posted to a window (using PostMessage) can be "targeted" to either the window or a view contained within that window. Because of the connection between windows and views, a view typically receives messages in the context of its window. Said another way, the handling of messages targeted to a view occurs in the window's thread.

On the BeBox, user actions on the keyboard and mouse are turned into BMessages, called interface events. However, these messages are not handled by MessageReceived(), like the BeBounce message BB\_HELLO. Instead, interface events are dispatched to a set of virtual functions corresponding to the action. Here are a few of those functions:

```
BView::MouseDown()           // mouse down event in that view
BView::KeyDown()             // keydown event while that view was
```

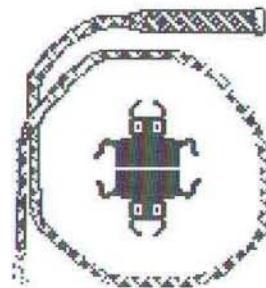
Gives you the Information to *Program your Best!*



# The Debugger V2 & MacNosit

by Steve Jasik

Information



Control

**T**he Debugger is a low and high-level symbolic Debugger that runs in a full multi-window Macintosh environment. You can trace program execution, view the values of variables, etc. **of both 68K and PowerPC programs.**

**MacNosit** is a global interactive disassembler that enables one to recover the source code of any Mac application, resource file or the ROM.

When you compare features of the different debuggers, note that *only one* has all the below features to help you get your job done, and *only one* has MacNosit to help you debug any program in a full system (6.0x or System 7.x) environment symbolically!

It is the *only* debugger to use the MMU to protect your CODE resources and the rest of the system from the program you are debugging. With MMU Protection you can find errors when they happen, not millions of instructions later! (Macintoshes with 68030 CPUs only).

The Debugger is the debugger of choice at: Adobe, Aldus, Claris, Electronic Arts, Kodak, Metrowerks, etc.

WindowRecord_@465320	
<b>WindowRecord</b>	
0 port	: CGrafPort_@465320
108 windowKind	: 8
110 visible	: TRUE
111 hilited	: TRUE
112 goAwayFlag	: TRUE
113 spareFlag	: TRUE
114 strucRgn	: ^Region_@488974
118 contRgn	: ^Region_@485534
122 updateRgn	: ^Region_@485980
126 windowDefProc	: ^DEFfunRsrc_@8768F0
130 dataHandle	: #485970
134 titleHandle	: #485918 = "Untitled-1"
138 titleWidth	: 67
140 ControlList	: NIL
144 nextWindow	: WindowRecord_@465278
148 windowPic	: NIL
152 refCon	: \$00464F28

An example of a structured data display window

## Its Features Include:

- **Symbolic Debugging** of any Macintosh program, ROM, or *code resource* (DRVRS, XCMDs, INITs, PDEFs, 4DEXs ..)
- **Source level debugging for Metrowerks & MPW** compiled programs (C++, C, Pascal, Fortran, ...), and an Incremental Build System with instant Link for superfast development.
- **Object Inspector for MacApp 3 programs**
- **Source level debugging of Think C™ projects**
- **Includes a program (CoverTest) to interactively do Code Coverage analysis for SQA testing, etc.**
- **Simultaneous Symbolic debugging of multiple "tasks"**
- **Fast Software Watchpoint** command to find clobbered variables
- **Sophisticated error check algorithms** such as Trap Discipline (Argument Checking), Handle Zapping, Heap Scramble and Heap Check to detect program errors before they become disasters
- **Structured display** of data (hypertext) with user definable structures while debugging
- **Conditional breakpoints** to help filter out redundant information
- **Continuous Animated Step Mode** to watch your program execute instruction by instruction
- **Detailed symbolic disassembly for both 680x0 and PowerPC** with symbol names, labels, cross ref maps, - make it possible to ferret out the secrets of the ROM, etc.
- **"Training Wheels"** for the PowerPC disassembler to help you learn the opcodes

## The Debugger V2 & MacNosit: \$350

Runs on all Macs. Call For Group prices or Updates. Visa/MC Accepted.

**Available from:** Jasik, APDA, Frameworks or ComputerWare (800-326-0092).

**Jasik Designs • 343 Trenton Way, Menlo Park, California 94025 • (415) 322-1386**

Internet: [macnosy@jasik.com](mailto:macnosy@jasik.com) • Applelink: D1037

# You Can't Wait Forever.

## Let's Face It.

As a professional developer or webmaster, you have to think of yourself first. You have deadlines to meet, products to deliver, and people depending on you.

## A Tool in Hand...

Your tools are your livelihood. You need up-to-date technologies and timely support. You can't afford to wait for vaporware to materialize or for your tools vendor to leisurely add features that you need today.

## When Hell Freezes Over?

When was your text editor last updated? Six months? A year? Five years? And when you contact the vendor that produced it, do they tell you how they're working on the next great version, how wonderful it's going to be, and how it will ship "Real Soon Now"? Or worse yet, do you get a disconnected phone number?

## That's where we come in.

At Bare Bones Software, we deliver the best tools here and now. We have a distinguished tradition of continually enhancing the functionality, performance, and design of our products to meet our customers' needs. We don't allow our products to languish until we feel like doing something about it. We won't hype vaporware as the solution to today's problems. And we haven't drifted in and out business on a whim. **We're here to support you for the long haul.**

## What About the Software?

You don't have to wait for the software, either. We're constantly refining our techniques and technology to bring you the fastest and most efficient tools. As the result of our efforts, BBEdit has repeatedly raised the standard for Macintosh text editing. (In fact, we've done so many cool things, several of our competitors have tried to copy us. Imitation is the sincerest form of flattery, after all. We're *very* flattered.)

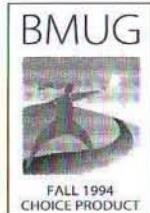
## Why Believe Us?

Since its commercial debut in 1993, BBEdit has set the pace for capability, user-interface, functionality, and customer support that others have yet to match. BBEdit was the first text editor to support ToolServer, THINK Reference, Toolbox Assistant, THINK C/Symantec C++, Internet Config, Quickdraw GX printing, PowerTalk, PowerPC acceleration, AppleScript, Apple Guide, and Macintosh Drag and Drop. We're still setting the pace for others to follow, as the only Macintosh text editor to integrate directly with Metrowerks CodeWarrior, through the use of the ClickWarrior extension.

## See for Yourself.

We've painted a great picture, but don't take our word for it. Visit our Web site and see for yourself. You'll find lots of things to like.

**BBEdit. Because you  
can't wait forever.**



Visit us at Developer Central, MacWorld Exposition San Francisco. January 9-12, 1996.

# Clean Up Your Act.

## Introducing SoftPolish.

SoftPolish is a quality assurance tool that helps you deliver applications that are clean, consistent, and free from spelling and user-interface mistakes.

## End Embarrassing Odor and Wetness.

Apply SoftPolish to your product's resource file (or built application). SoftPolish checks file integrity, scans the application signature, menu and 'cmnu' resources, controls, dialog items, pictures, strings, 'TEXT' resources, windows, and Balloon Help™ resources. It reports any structural, spelling or typographical errors that it encounters. SoftPolish also checks the layout of dialogs and controls to make sure that items don't overlap. At your request, SoftPolish will also correct spelling mistakes, so you'll never again ship a product with embarrassing typos.

## Put on a Pretty Face.

When preparing your product for release, use SoftPolish to ensure a perfect presentation to the world: it cleans up unwanted resources in your files (such as extraneous 'SIZE' and 'ckid' resources), sets creation and modification dates to a consistent value, and checks the spelling of file and folder names. After all, your customers don't really need to know that the product was built at 4:30 AM on the day after you announced... Do they?

## A Software Mine Sweeper.

When applied to a 68K application, SoftPolish also catches code that you wouldn't want your customers to see: Debugger and DebugStr calls, CHK and TRAPV exceptions, and Macsbug symbol names.

## SoftPolish. The Essential Tool for Software Quality.

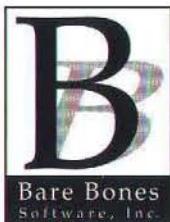
Visit our Web site or contact us for more information about SoftPolish and our other fine products.

*Something for nothing.* Although our commercial products have won critical acclaim and popular support worldwide, we've also built a reputation for producing free software that exceeds the quality standards of many commercial products.

**BBEdit Lite** The freeware cousin to our award-winning text editor. Used and loved by countless people worldwide.

**Drop•PS** Sends PostScript™ or EPS files to any network-connected PostScript printer.

**PopupFuncs** Adds source-code navigation abilities to any PopupFuncs-aware text editor or integrated programming environment (including MPW, Symantec C++ and Metrowerks CodeWarrior). Enables you to browse C, C++, Pascal, 68K Assembler, Rez, and FORTRAN source files.



Bare Bones Software, Inc.  
P.O. Box 1048  
Bedford, MA 01730-1048  
USA

Voice: (508) 651-3561  
Fax: (508) 651-7584

E-mail: bbsw@netcom.com  
Web: <http://www.tiac.net/biz/bbsw/>  
FTP: <ftp://ftp.std.com/vendors/bbsw/>  
<ftp://ftp.netcom.com/pub/bb/bbsw/>

Our goodies can also be found at many popular sites, including the file libraries of AOL, CIS and eWorld.

Our lawyers insist we say: BBEdit, BBEdit Lite, PopupFuncs, SoftPolish, Drop•PS and our spiffy logo are trademarks of Bare Bones Software, Inc. Mac and the MacOS logo are trademarks of Apple Computer, Inc., used under license. PowerPC is a trademark of International Business Machines Corporation. All other trademarks and registered trademarks are properties of their respective holders. Bare Bones Software, Inc. products are cruelty free (except for a few beta testers). © 1996 Bare Bones Software, Inc.

**POSITIONS WANTED**

*Available Immediately* 1-800-736-3577

**Expert 4D Programmers  
Less than 50¢ per hour!**

More than 1,000 hours of development went into 4D Toolkit 2.0. With a one time price of \$395.00\*, it's like hiring a crack team of 4D programmers at less than 50¢ per hour. Call 1-800-736-3577 to order your copy, or to receive a free demo.

## 4D TOOL KIT™

OPtrions Computer Consulting  
228 Bleeker Street #19  
New York, NY 10014  
TEL: 212-645-3577  
FAX: 212-633-0336

\* upgrade pricing available

```
BView::FrameResized           // the "focused" view
BWindow::FrameMoved()          // the view changed size
BWindow::QuitRequested()       // the window position moved
                                // click on close-box of window
```

It turns out that in BeBounce only two interface events are of interest, the FrameMoved and QuitRequested events. The system repeatedly generates the FrameMoved event as a window is being dragged. This event is of interest because as the window moves, so should the gap that exists between the partner windows. Here is the code for responding to the FrameMoved event:

```
void TWindow::FrameMoved(BPoint new_pos)
{
    /*
     * As window is moved around the screen we inform our
     * partner of our new location. Also update our gap.
     */
    fMyFrame = fFrame();
    if (my_app->SendPosition(fMyFrame))
        WindowsMoved(fMyFrame, fPartnerFrame);
}
```

This code gets the window's current location and sends it to our partner so that our partner can update its gap. TBounceApp::SendPosition() sends the BB\_WINDOW\_MOVED message to the partner (see the code in TBounceApp::MessageReceived() for the code that handles this message). Only if we have a partner will

TBounceApp::SendPosition() return TRUE. In this case the code calls the TWindow::WindowsMoved() function, updating this window's gap. As BeBounce windows move about the screen everything is kept in synch.

The other event of interest is generated when the user clicks on the close box of the window. In BeBounce closing the window should also cause the application to quit. This means that the window has to listen for the QuitRequested event:

```
bool TWindow::QuitRequested()
{
    /*
     * The window was asked to quit/close. Send a message to our partner, giving him
     * the ball if we've currently got it.
     */
    BMessage *m = new BMessage(BB_GOODBYE);
    if (fBall) {
        fBall->Quit();
        fBall = NULL;
        m->AddBool("ball", TRUE);
    }
    my_app->SendToPartner(m);

    // Tell the app to go ahead and quit.
    my_app->PostMessage(QUIT_REQUESTED);
    return TRUE;
}
```

The first thing to do when the QUIT\_REQUESTED message is received is to tell our partner good-bye, passing the ball along if it is in our possession. It would not be polite to quit with ball in hand. Please note that the TBounceApp::SendToPartner() does the correct thing if there is no partner. Next the window posts a message to the application telling it to quit as well. The return value of TRUE causes to window to immediately quit.

### The ball

The last object to describe is the ball. Several factors influenced the design of the ball. It is desirable to keep the ball independent from the window, yet they still need to communicate with each other. Also, the ball periodically requires time to simulate motion. One design that accommodates these guidelines is to construct a subclass of BLooper called TBall. This means that the ball has its own thread and it is able to receive messages. Here is part of the class definition:

```
class TBall : public BLooper {
public:
    TBall(TWindow *window, BRect bounds,
           BPoint center, float radius,
           BPoint speed);

    virtual void Draw(BView *view);
    virtual void MessageReceived(BMessage *msg);

    void Lock();
    void Unlock();
    void SetGap(float start, float end);
    void SetEnabled(bool state);
    ... // a couple other member functions

private:
    void NextPosition(bool *hit, float *angle);
    Tick();
```

# FREE INSTALLER!

To: Mac Developers & Product Managers

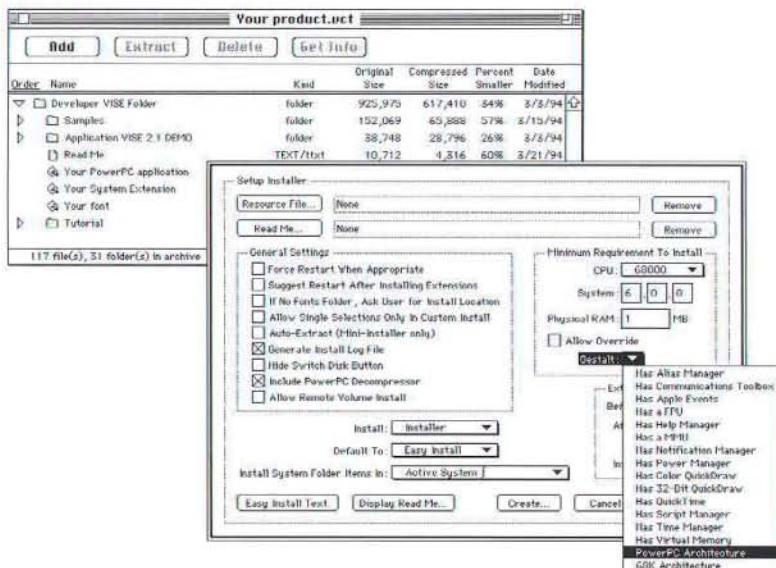
From: MindVision (Co-authors of Speed Doubler)

Subject: Free Copy of DEVELOPER VISE

Message: We've got a great new installer for you.  
Here's your chance to try it for free.  
No risk, no obligation, no hassle.  
Call today, don't delay!

Full PowerPC  
Support

Integrated  
compression



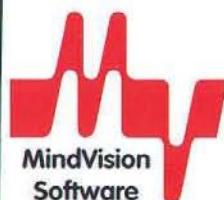
No programming  
required

Fully graphical  
interface

# www.mindvision.com

INTERNET: SALES@MINDVISION.COM • APPLELINK, AOL, MINDVISION • COMPUSERVE 70253, 1437

Join the growing list of companies who use our VISE technology: Adobe, America Online, Apple, Claris, CompuServe, Connectix, Intuit, MacroMedia, Netscape, Symantec, WordPerfect, and hundreds others.



MindVision Software 840 South 30th St., Suite C, Lincoln, Nebraska 68510  
Voice: (402) 477-3269 Fax: (402) 477-1395 Internet: sales@mindvision.com  
AppleLink, AOL: MindVision • Compuserve: 70253,1437

© 1992-96 MindVision Software. All Rights Reserved. Developer VISE is a trademark of MindVision Software.



```

    BLocker fLock;
    TWindow *fWindow;
    ... // a bunch of data members for "state" like size,
    // speed/direction, position, etc
};


```

Having a thread per ball would not scale to an application that had 1000 bouncing balls, but for demonstration purposes it works well.

Most of the constructor for the TBall class is fairly simple, initializing the various data members. The most interesting aspect of the constructor is that it starts the looper thread running and posts the first BB\_TICK message to get the animation working:

```

TBall::TBall(TWindow *window, BRect bounds, BPoint center,
    float radius, BPoint speed)
: fLock()
{
    ... // initialize parameters like size, location, and speed

    /*
    Get the looper thread rolling. Unlike the call to BApplication::Run, which does not
    return, this call does return.
    */
    Run();

    // post initial message to get animation going
    PostMessage(BB_TICK);
}

```

The TBall's MessageReceived function handles the BB\_TICK message:

```

void TBall::MessageReceived(BMessage *msg)
{
    switch (msg->what) {
        case BB_TICK:
            Lock();
            Tick();
            Unlock();
            ...
            // sleep for a little bit of time
            ...
            // post next message to continue animation
            PostMessage(BB_TICK);
            break;
    }
}

```

The Lock() and Unlock() calls shown above deserve further explanation. The BeBounce application was designed so that the window "communicates" with the ball, not by posting messages to it, but by calling specific member functions; see the definition of the TBall class. For example, one of those functions is TBall::SetGap():

```

void TBall::SetGap(float start, float end)
{
    Lock();
    fGapStart = start;
    fGapEnd = end;
    Unlock();
}

```

A consequence of this design is that two separate threads access the same data structure, so some form of synchronization is required. The BLocker (also known as

"blocker") class provides this synchronization. Imagine if the locking was not present. Then in the middle of the looper thread's calculation to determine if the ball hit that gap the window thread could come along and change the gap. This would lead to undefined behavior. Code in TBounceApp::MessageReceived() locks the window for this same reason.

An alternate design would have the window sending messages to the ball. In this case, locking would not be an issue. The act of posting messages implicitly provides the synchronization needed. The ball's looper thread can only handle one message at a time. In this example the trade-off might be the latency of messages changing the "gap" position or starting and stopping the ball, with the **Stop Ball** menu item. The preferred method should be determined on a case by case basis. For educational purposes the BeBounce application uses both styles of programming.

Back to the BB\_TICK message. Most of the work in animating the ball is done in TBall::Tick(), and most of that code is the math and geometry needed to animate the bouncing ball and determine when the ball either hits a wall or flies through the gap. As little of this code is specific to the BeBox we will not go into any more detail except to show how the ball draws.

```

void TBall::Tick()
{
    ...
    // move ball to new position

    // inform the window to redraw the window.
    BMessage *msg = new BMessage(BB_DRAW);
    msg->AddRect("update", updateRect);
    fWindow->PostMessage(msg);

    if (hit_hole) {
        /*
        The 'gap' was hit. So we package up the info like speed and relative location,
        which gives our partner enough information to have the ball appear in the
        correct place.
        */
        BMessage *msg = new BMessage(BB_HIT_HOLE);
        ...
        // adding info to message
        fWindow->PostMessage(msg);
    }
}

```

The TBall::Tick() function moves the ball to the next position and then posts a message to the window telling it to redraw itself. Additionally, if the ball hits the "gap" a BB\_HIT\_HOLE message is posted to the window:

When the window receives the BB\_DRAW message (in its MessageReceived function) it asks the ball to draw itself in its current location. The drawing is done by TBall::Draw():

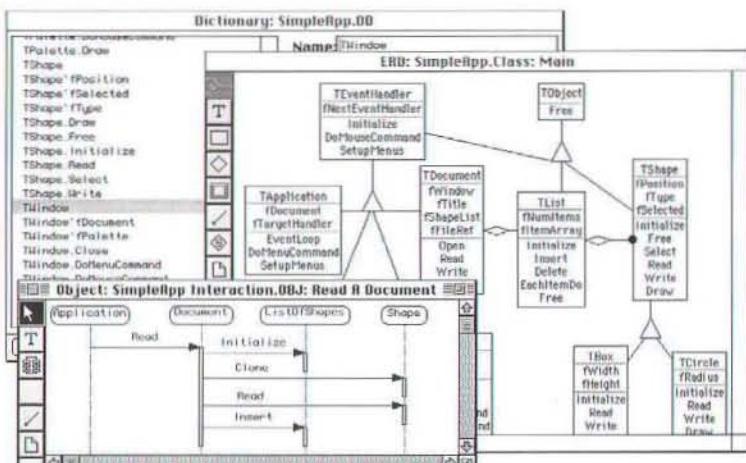
```

void TBall::Draw(BView *view)
{
    // The ball draws itself in the given view
    Lock();
    rgb_color c = view->FrontColor();

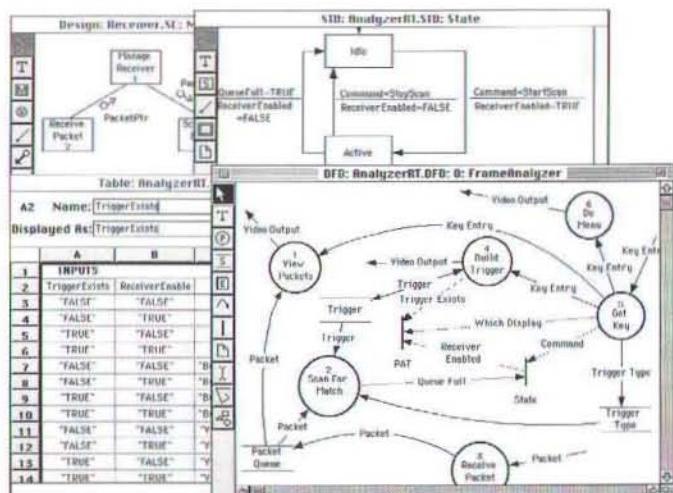
    view->SetPenSize(1.0);
    view->SetFrontColor(150, 30, 30);
    view->FillArc(fCenter, fRadius, fRadius, 0.0, 360.0);
    view->SetFrontColor(c);
    Unlock();
}

```

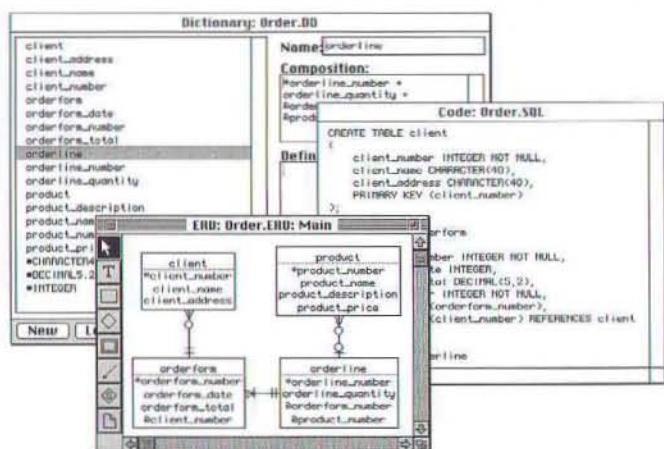
*Draw and verify your design, generate code or reengineer existing code back to diagrams.*



OOA/OOD includes OMT, Booch 94, Coad/Yourdon, Shlaer/Mellor...



Structured A&D using Yourdon/DeMarco, Gane/Sarson, Hatley/Pirbhai...



Data modeling and SQL generation for Information Engineering, Chen...

# MacAnalyst & MacDesigner

## Software Engineering

Structured Analysis & Design  
Object-Oriented Analysis & Design  
Real-Time & Multi-Task Design  
Data & Screen Modeling  
Integrated Code Editing & Browsing  
Multi-User Dictionary & Requirements  
Code to Design for C++, Pascal, Fortran...  
Design to Code for C++, Pascal, Fortran...

## New in Version 5.0

Jacobson, Fusion, Use Cases, Harel Statecharts, Interaction Diagrams and more

Products are available by single, site or educational license and supported with on-site training, update service, free newsletter and technical phone support. Products include sample documents, tutorials and online help.

## Product Options

MacAnalyst	\$ 995
MacAnalyst/Expert	\$1595
MacDesigner	\$ 995
MacDesigner/Expert	\$1595
MacA&D	\$2995
Translator	\$ 495

## System Requirements

Macintosh System 7 with 8 meg RAM or UNIX with Apple's MAE software. Winner of the 1994 CIO Magazine Readers' Choice Award, MacAnalyst and MacDesigner are used by thousands of developers worldwide for personal computer, mainframe and embedded software projects.

Call now for free technical brochures!

**Excel Software**  
**515-752-5359**

P.O. Box 1414 • Marshalltown, IA 50158  
casetools@aol.com • Fax: 515-752-2435

MacAnalyst, MacDesigner, MacA&D and Translator are trademarks of Excel Software. All rights reserved.

**QUALITY:**  
Compatibility  
Bug Reporting  
Test Plans & Suites  
Regression  
Metrics

**ENGINEERING:**  
Design  
Development  
Code Reviews  
Debugging  
Analysis

22 Years of  
Macintosh  
Experience

## "QUALITY DEVELOPMENT"

14 Years  
Experience at  
Apple

**HARDWARE:**  
PCMCIA cards  
MacOS Clones  
PCI/NuBus cards  
Modems  
Printers

**SOFTWARE:**  
Drivers  
Applications  
CD-ROM Titles  
Extensions  
Utilities



Apple  
Computer  
Partners

**POWERLABS**  
975 Town & Country San Jose, CA 95128  
(408) 24-POWER

Engineering  
& Quality  
Assurance

The view passed to TBall::Draw() is the same view that was added to the offscreen bitmap in the TWindow's constructor, so the ball is being drawn offscreen. The window then gets the TBitmapView (described earlier) to blit the offscreen image onto the screen.

The code for handling the BB\_HIT\_HOLE message is in TWindow::MessageReceived:

```
void TWindow::MessageReceived(BMessage *msg)
{
    switch (msg->what) {
        case BB_HIT_HOLE:
        /*
        The ball is telling us that it just hit the
        hole. So it should get sent to the partner.
        */
        BMessage *m = new BMessage(BB_BALL);
        fBall->Lock();
        m->AddPoint("speed", msg->FindPoint("speed"));
        m->AddFloat("rel_loc", msg->FindFloat("rel_loc"));
        fBall->Unlock();

        // send the 'ball' to our partner
        my_app->SendToPartner(m);

        // delete the ball from this window
        fBall->Quit();
        fBall = NULL;

        // redraw the window
        Update();
        break;
    }
}
```

... // handling of other messages

The window responds to the BB\_HIT\_HOLE message by sending the BB\_BALL message to the partner application giving it the ball. It puts the necessary information into the message so that the partner can create the new ball in the correct position, with the correct speed and direction. Finally, the window deletes the ball.

That is how the BeBounce application works. Obvious improvements to BeBounce would be to support more than two applications, multiple windows within the same application, and multiple balls. Another useful addition would be a separate control window with some controls for things like ball speed. All of these enhancements are feasible given the design of the Be operating system. To support an arbitrary number of applications each application would maintain a list of partners, having a BMessenger object to each one. Multiple balls in a window could either communicate with one another (for hit testing purposes) directly or use the window object as the arbitrator.

Hopefully this sample application has provided a taste of developing an application for the BeBox. The next question is: How do Be applications get built?

**At ICONIX, we have a 10 year record of being 2 years ahead of the industry. Since 1985, we have maintained the foresight to consistently create products 2 years ahead of our competition. This year, we've done it again...**

• 1995 - Maintaining the standard of excellence set by our popular "Object Methodology Overview", our new "Unified Object Modeling Approach" training CD-ROM combines the best elements of Rumbaugh, Booch, and Jacobson methods, with prototyping, for full lifecycle modeling from requirements to code generation. And now, **ICONIX** makes its full suite of PowerTools™ available for the PC platform!

**PowerTools are now available for DOS, Windows 95, Windows NT, Windows 3.1, OS/2, Mac, NextStep, SunOS, Solaris, HP-UX, SGI IRIX, AIX, Alpha and Linux!**

• 1994 - **ICONIX** eliminates the "industry standard" UNIX price markup with our "one price - all platforms" MOTIF releases for UNIX. Our SQA enhancements give users the ability to associate Requirements, Test Cases, Bug Reports, and Change Requests with class, object, and use case models.

• 1993 - Complete support for integrated Booch, Rumbaugh, Jacobson, and Coad/Yourdon models.

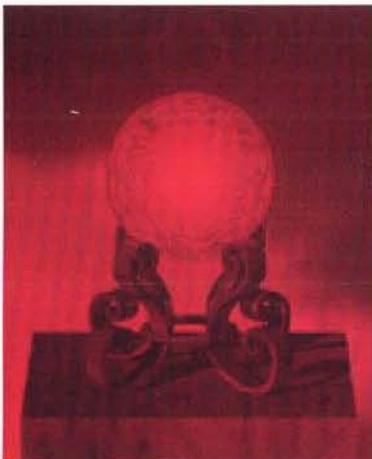
• 1992 - Addition of OMT support, and **Integrated Requirements Traceability**

• 1991 - Initial Support for OOA and OOD using Booch and Coad/Yourdon methods.

• 1989 - Support for Ada/OOD gets added to our existing real-time, structured CASE tools.

• 1987 - We add **multi-user** capability to our tools, in support of large programs such as the Space Station.

• 1985 - **ICONIX** pioneers easy to use, low cost, GUI-based CASE tools on the Macintosh.



**See The Future...**

**ICONIX**  
Leadership in Object Technology™

*You can wait 2 years and get left behind with our competition...or see the future NOW:*

Visit us on the Web: <http://www.biap.com/iconix/>, call us at 310-458-0092, or email iconix@eworld.com

### DEVELOPMENT TOOLS

You write applications for the Be environment using tools supplied by one of the leading tool suppliers in the industry – Metrowerks. Currently the preferred development environment is a Macintosh with the latest version of CodeWarrior and Be-supplied headers and libraries. Using CodeWarrior on the Macintosh, a developer can write, compile, and link a Be application. Of course, you have to transfer the application to the BeBox before it will run. Since the BeBox supports ftp and includes a command-line shell (based on bash) the process of quitting your app, bringing over a new one from the Macintosh, and running it on the BeBox can be completely automated. There is also support for using the source-level debugger on the Macintosh to debug an application while it is running on the BeBox. Metrowerks is currently working on a port of the full CodeWarrior Integrated Development Environment to the Be operating system. This native version of CodeWarrior, along with full technical developer documentation, will be shipped with every BeBox.

### CONCLUSION

This is just a small taste of the BeBox. We have presented an overview of the Be operating system along with some sample code to give you the general feel of Be application

development. To learn more about the Be operating system, please visit our web site, where we provide on-line versions of our developer documentation as well as information about our product and company. We encourage developers interested in joining our support program to mail in the developer form, which you can find on the web site.

Be has many plans for the future. We are continuing to improve and add features to the Be operating system and development tools. We are also working on future versions of the BeBox, which will include more and faster processors – including a machine with four PowerPC 604 chips for the horsepower hungry.

We hope this article has succeeded in whetting your appetite for Be programming. We look forward to seeing all the incredible applications we know developers will write for the BeBox.



**Visit MacTech Magazine's Web site!**

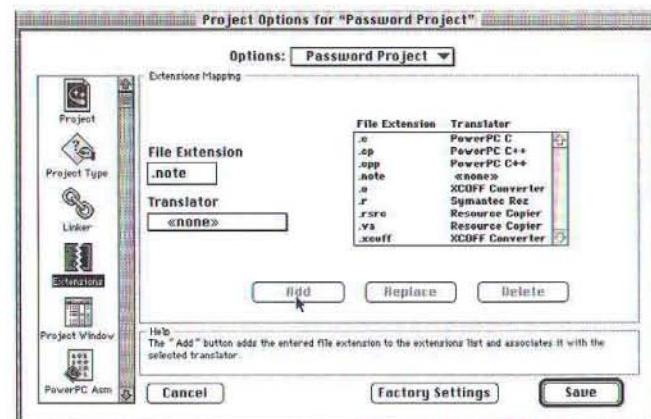
<http://www.mactech.com>

By Michael Hopkins, Symantec

*This monthly column, written by Symantec's Technical Support Engineers, aims to provide you with technical information based on the use of Symantec products.*

**Q:** I want to be able to add files to my project, such as ReadMe files and notes, without having the project manager attempt to compile them. Is there any way to create an extension such as a .note extension in the SPM that does not use a translator?

**A:** Yes, there is. Quit the SPM and open your Symantec C++ folder. Copy the file «none» from your Translators folder (the one with the THINK Project Manager icon) to your (Translators) folder (the one with the Symantec Project Manager icon). With ResEdit, open the copy and choose **Get Info for «none»** from the **File** menu. Change the creator from KAHL to None. Save the file, and quit ResEdit. Now go back and launch your project in the Symantec Project Manager and choose **Options...** from the **Project** menu and go to the **Extensions** page. Type the name of the extension that you want to use for your non-compiled source files in the **File Extension** edit text box. Choose **«none»** from the **Translator** popup menu, click the **Add** button and then click the **Save** button.



*Adding .note to the File Extensions List*

**Q:** When I run my program with the Symantec Debugger from the Symantec Project Manager, the source code window does not come up and the debugger palette buttons **Go**, **Step**, **In**, etc. are not active. What is causing this, and how can I fix it?

**A:** This behavior is a result of your application being compiled with incorrect 'SIZE' flags. The debugger requires that your project has **Background Null Events** and **MultiFinder Aware** checked on the Flags popup menu in the Project Type page of the Project Options dialog. Without these flags, Power Mac DebugServices will not be able to communicate with your application.

**Q:** I have written a brief program in the THINK Project Manager that is crashing my machine big time. The code is as follows:

```
typedef struct {
    int a, b;
} Foo, *FooPtr;

main()
{
    FooPtr foobuf;
    int i, size = 100;

    foobuf = (FooPtr) malloc( size*sizeof(Foo) );
    if (foobuf == NULL)
        exit(0);
    for ( i = 0; i < size; i++ )
    {
        foobuf[i].a = 0;
        foobuf.b = 0;
    }
}
```

Why is this causing me so much trouble? Is something wrong with malloc?

**A:** No, malloc is not at fault. By not including <stdio.h> and <stdlib.h>, your compiler does not have a function prototype for malloc, so it is guessing (incorrectly) about the size of the argument to malloc. Instead of using the type `size_t`, it is assuming an `int`. To avoid this problem, always choose **Require Prototypes** on the **Language Settings** page of your **THINK C Options** dialog. With that option selected, this would have resulted in a compilation error instead of a runtime error.

**Q:** Can I use Quickdraw GX with TCL and VA?

**A:** Yes, it is possible. For starters, initialize Quickdraw GX in `CApp::ICApp()` in the following manner:

```
void CApp::ICApp()
{
    IX_CApp(4, 24000L, 20480L, 2048L);

    // Initialize your own application data here.

    long graphicsHeapSize = 375; //about 25K

    theGXClient = GXNewGraphicsClient( nil, gGraphicsHeapSize *
        1024L, 0L );
    FailNIL( theGXClient );
    GXEnterGraphics();

    assert (GXGetGraphicsError( nil ) != out_of_memory);
    //etc.
}
```

You will need to declare `theGXClient` as a member function of `CApp` of type `gxGraphicsClient` and include the proper header files in `CApp.cp`. Additionally, it is a good idea to override `CApplication::InspectSystem()` to check for the presence of QuickDraw GX. It is considered programmer error to call GX routines without verifying via `Gestalt()` that GX is present. Finally, override `CApplication::Exit()` in `CApp` using the following example:

```
void CApp::Exit()
{
    GXExitGraphics();
    GXDisposeGraphicsClient( myGXClient );
    //etc...
    x_CApp::Exit();
}
```

**Q:** Why does `printf` crash when I use it in a TCL project? Is there any way to use TCL in conjunction with the console?

**A:** Yes, there is. The console package does some special initialization that needs to be done in place of the standard toolbox initialization that TCL does. To use the console with TCL, you should override `CApplication::InitToolbox()`, like this:

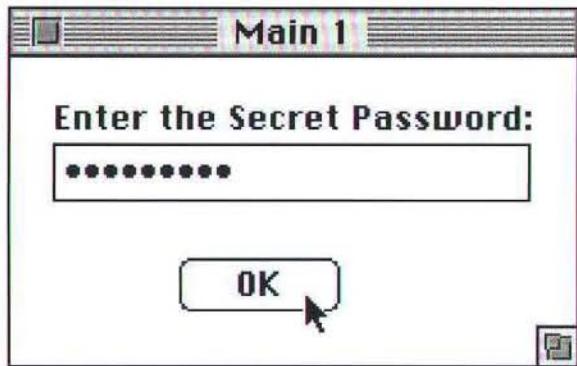
```
void CApp::InitToolbox( void )
{
    cout << "Initialize console package" << endl;
}
```

The call to `cout` in place of the standard `CApplication::InitToolbox()` will initialize the toolbox and the console package. This will enable the use of `printf` and `iostreams` routines with the console window. **Note:** You will need to add the `IOStreams` library and replace `ANSI_small` with `ANSI`.

**Q:** How do I make an application (or the Project Manager) multi-session, so I can throw it on a server and have several users run the application off of the server at the same time?

**A:** Use ResEdit to open the application you want to share. From the **File** menu, choose **Get File Info** for the application, and click the **Sharable** flag. **Save** the application, and **Quit** ResEdit. Your application can now be used by multiple users simultaneously.

**Q:** I am working on an application that prompts the user for a password. I need to be able to filter the edit text so that it displays bullet characters instead of the actual password. Is there an easy way to do this in VA?



*Example of an Application that uses a Password Edit Text Filter*

**A:** Yes. You must first create a derived class from `CDialogText` in VA. Then override the `DoKeyDown()` method in the following manner:

```
void cPasswordText::DoKeyDown( char theChar, Byte keyCode,
    EventRecord *macEvent )
{
    Boolean pass = TRUE;
    short ID;
    Str255 textString;

    switch (theChar)
    {
        case TCL_CR:
        case '\t':
        case kEnterKey:
            pass = FALSE;
            break;
        case kEscapeOrClear:
            if (keyCode == KeyEscape) pass = FALSE;
            break;
        default:
            GetTextString( textString );
            if ( ! isalnum( theChar ) ) //pass spaces and delete keys
            {
                inherited::DoKeyDown( theChar, keyCode, macEvent );
            }
    }
}
```

# MacForth Plus & Power MacForth



**The Language of Innovation is now available native on the Power Macintosh.**

## FEATURES

- Royalty Free Turnkey Compiler
- Text Editor
- Online Glossary Tool
- System 7 Compatibility
- 68020 Assembler
- 6881/2 Co-processor Support



*Creative Solutions, Inc.*

4701 Randolph Road, Suite 12  
Rockville, MD 20852  
301-984-0262 or 1-800-FORTH-OK (orders)  
Fax: 301-770-1675 AppleLink: CSI

```
    pass = false;
}
if (pass)
{
    textString[0]++;
    textString[textString[0]] = '*';
    SetTextString( textString );
}

// add code to store actual characters typed here

if (itsTypingTask && itsTypingTask->CanStillType())
{
    ID = this->ID;
    BroadcastChange(dialogTextChanged, &ID);
}
else
    itsSupervisor->DoKeyDown(theChar, keyCode, macEvent);
```

**Q:** Can I use STL with Symantec C++?

**A:** Yes, Symantec C++ supports a modified version of STL. For best results, you need to use 8.0.3 of our Symantec C++ compiler. Patches are available via anonymous ftp at <ftp://devtools.symantec.com/updaters/sym.cpp-va-tcl.update>.

**Q:** I'm using your new Pascal Universal Headers for THINK Pascal and I get pages of link errors. Why is this?

**A:** When you use our Universal Headers, you need to make sure that you have the proper uses statements for the toolbox routines that you are using. You can no longer rely on the correct uses being used automatically. You will need to be very conscious of which interface file you use. See the Readme for further details.

**Q:** I call the Place() method of a CPanorama object I have created in the Main view using VA, but nothing happens. Place() works fine for other objects derived from CPane. What gives?

**A:** Place(), inherited from CPane, sets the data members hEncl and vEncl, which indicate the pane's position relative to itsEnclosure. In the case of CIIconButton, for instance, itsEnclosure will be the itsMainPane member of the Document (itsMainPane is the CPanorama object that acts as the background of every view of type Main Window). Hence, calling the Place() member of a CIIconButton visibly moves the button relative to the window. In the case of a CPanorama object however, itsEnclosure is actually itsScrollPane. A panorama's Place() function will not visibly change its position. You should instead call itsScrollPane->Place() to move a panorama relative to the window.

If you have a question or topic for a future Top Ten article, please send us your ideas. If you have found an answer to an obscure problem that has been eluding you, or you have a stumper, send it to [topten@devtools.symantec.com](mailto:topten@devtools.symantec.com). If we choose to use your question in our column, your submission will be immortalized in print, and we will mail you a cool Symantec T-shirt.

Special thanks to: Glenn Austin, Mark Baldwin, Levi Brown, Craig Conner, Andy McFarland, Christopher Prinos, and Kevin Quah.



To receive information  
on any products  
advertised in this issue,  
send your request  
via Internet:  
[productinfo@xplain.com](mailto:productinfo@xplain.com)

# <http://www.mactech.com>



#### Special Messages:

Note: While most of this site is complete, you may see some things still under construction. Please excuse "the mess". :)

The [Programmer's Challenge](#) is now available on this web. Each month, programmers compete to produce the fastest, tightest code.

The new [MacTech CD](#) is shipping at a new ~~low~~ price of \$49!

Did you go to Macworld but forgot to get information from a developer tool vendor? Check out information on [Developer Central](#) sponsored by Apple and MacTech.

You've found your way onto the MacTech Web™ site. To date, you'll find some 1500+ pages of material here. The focus of this site is to support the Mac™ OS programmer and developer community. Here you will not only find support for MacTech Magazine, but you also get access to an number of useful places on the net for Mac developers as well as information on how to get the latest Macintosh [development tools](#).

Let us know what you think of the site. It's a living, breathing beast and we're here to improve it, change it, nuke it and grow it. Our webmaster address is almost always available at the bottom of each page on this site.

— The folks at MacTech Magazine  
10/2/95 - 15:21 (PST)

## (Need we say more?)

For Macintosh  
Programmers & Developers

**MacTech**™  
MAGAZINE

# SPECIAL INTERNET SECTION

Sponsored by WebEdge

## TCP/IP Scripting Addition

The **TCP/IP Scripting Addition** allows you to quickly develop Internet client/server applications using AppleScript®. If you want to script with MacTCP™ and Open Transport™, here's your solution!

- ◆ Supports ScriptEditor, FaceSpan™, and HyperCard™
- ◆ Build net-wise WebSTAR™ CGI scripts and NetScape™ CCI scripts
- ◆ Sample scripts include FTP, Gopher, Telnet, Post Office, E-Mail and more
- ◆ Featured on the Apple® Internet Server



Order now through the MacTech Mail Order Store at 805-494-9797 or other mail order stores



**Mango Tree Software, Inc.**

Box 1057 • Brookline, Massachusetts 02146  
617-327-8663  
<http://www.mangotree.com/biz/mango>

All trademarks are properties of their respective holders.  
Contact Mango Tree Software for site licensing and redistribution information.  
Copyright © 1996 Mango Tree Software, Inc.

## *The Internet Scripting Solution*

**FTP Parameters**

Set these parameters for (sending) files:

**FTP Host:** ftp  
**Directory:** we

**User ID:** mangotree  
**Password:** \*\*\*

**Type of file transfer:**  ASCII File  MacBinary File

**Telnet Libre**

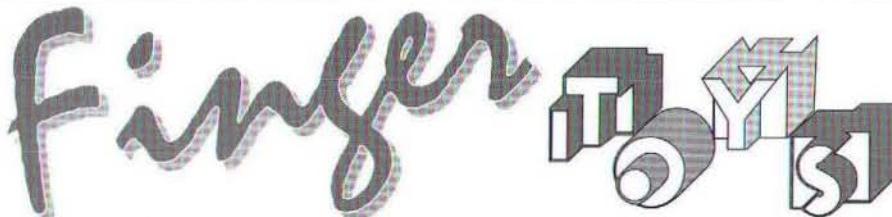
Description:

Telnet Library v1.0  
Copyright © 1995 Mango Tree  
All Rights Reserved

Record Stop Run

```
set my_telnet_stream to telnet "your_host"
tell my_telnet_stream
try
    connect(your_host)
    read_until_text("loc")
```

## ACME TECHNOLOGIES Introduces . . .



**Internet Daemon for Macintosh**

**FingerToys** is fully customizable! Run it as a Finger daemon out of the box, or write your own backend in AppleScript, Frontier, or C/C++/Pascal to support other protocols.

Acme Technologies • 54 Fairfield Avenue • Norwalk, CT 06854  
(203) 857-0631

- Power PC Native
- Threaded
- Scriptable
- Real-time status display or background-only daemon
- Use as WWW->Finger CGI gateway for WebSTAR

**Only US \$79**

Demos and information available from

<http://www.acmetech.com/>  
[Sales@acmetech.com](mailto:sales@acmetech.com)

# SPECIAL INTERNET SECTION

Sponsored by WebEdge

JAVATECH™

By Hillel N. Cooperman and Aparajita Fishman, Cambridge, MA



## Java Rules

### A Java FAQ

*This is the first in what will be several articles on Java and the Macintosh implementations. Watch this column in the future for a beginner lesson on Java programming and reviews of offerings from Natural Intelligence, Borland, Sun, and others for Macintosh programmers.*  
— Contrib. Ed, jaw

Considering the amount of hype surrounding Java, it is nearly impossible, without a lengthy and thorough investigation, to really understand what Java is all about, and to know what it can and cannot do for you. As an antidote to all the hype, we are going to try to give some honest answers about Java in this article. We hope it will be helpful as you decide about how to pursue this new technology.

According to Sun's "The Java Language – A White Paper", Java is a "portable, interpreted, high-performance, simple, object-oriented" programming language. Buzzword-shy it is not. In the questions below we will look at Sun's claims and explain what they mean.

#### 1. WHAT IS JAVA?

Java is a programming language. It is really that simple. Much of the confusion on this topic is from people mixing up what Java will enable with what Java actually is. However, for the purposes of this article, Java's importance is based on what it is currently capable of doing. That's what we'll focus on.

First a little bit of history. In April of 1991 the Java development team (or "Green" team, as they then called themselves) started work in a building located off of the Sun campus. Java was originally conceived as a programming language and operating system for consumer electronics devices (i.e. set-top boxes). The team envisioned the technology being licensed in the same way that Dolby Systems licenses its noise reduction technology. While market forces shifted so that the set-top box market slipped away as a potential home for the Java technology, the Web appeared on the horizon as a likely candidate for Java-based interactivity. With this goal in mind, Sun introduced Java in May of 1995. Sun's current marketing reflects the idea that Java is *the* "Internet application language." We will try to delve a little deeper.

Yes, Java is a language but it is also a concept and an approach to deploying applications.

#### 2. WHAT IS A JAVA APPLET?

As we said before, many people confuse Java's capabilities with what Java actually is. The primary task with which people associate Java is creating interactive content for the Web. By this we mean a level of interactivity beyond the basic forms and buttons provided by a combination of standard HTML and CGI programming. An applet is a program that is called in the process of displaying HTML. Calling an applet from HTML looks like this:

---

**Hillel Cooperman & Aparajita Fishman** — Hillel Cooperman ([coop@natural.com](mailto:coop@natural.com)) and Aparajita Fishman ([aparajita@natural.com](mailto:aparajita@natural.com)) are, respectively, Chief Evangelist and a Senior Software Architect, at Natural Intelligence, Inc.

# SPECIAL INTERNET SECTION

Sponsored by WebEdge

```
<HTML>
<HEAD>
<TITLE>Applet Page</TITLE>
</HEAD>
<BODY>
<H4>This is an example of a Java applet:</H4>
<HR>
<APPLET CODE="myApplet.class" width=100 height=50>
</APPLET>
<HR>
</BODY>
</HTML>
```

Sample HTML

```
import browser.applet;
import awt.graphics;
class myapplet extends Applet {
    public void paint(Graphics g) {
        g.drawString("Hello world.", 25, 25);
    }
}
```

Sample Applet

When a Java-enabled web browser (such as HotJava or Netscape) encounters the APPLET tag, it loads the Java class (applet) referenced in the quotation marks. Once loaded, the browser runs the code contained in the applet and performs whatever function is specified by the code.

Having applets run in your web browser wouldn't be such a great feat if they weren't small enough to be loadable in a relatively short period of time; interactivity on the web is not very interactive if it takes an hour to load an applet. Just as Macintosh applications are built upon the Macintosh Toolbox, which provides a significant foundation of core functionality, Java applets are built upon Sun's AWT (Abstract Window Toolkit), a class library which provides applets with their core functionality. And just as the Macintosh Toolbox resides on each user's machine, so too is AWT a part of each user's browser, obviating the need to load AWT over the net. The end result is that Java applets tend to be very compact, which translates into faster load times.

### 3. IS JAVA ONLY GOOD FOR CREATING APPLETS?

Currently there are two options when using Java. The first is to create AWT-based applets which can only run within a Java-enabled browser or application. The second is any programs which use only console input and output. Although used mainly for applets now, Java is a robust, general purpose language with many possible applications.

### 4. HOW EASY IS IT TO GO FROM C/C++ TO JAVA?

It is very easy.

One of the Java team's stated objectives was to keep the language familiar to the majority of programmers. Java's expression syntax is the same as C's and it incorporates the key object-oriented features of C++. This was done to give programmers a common reference point when porting their skills to Java. And, from our perspective, Java provides most of the power of C++ with none of the pain. This was achieved by avoiding those "features" of C++ which, while providing tremendous power for those "in the know," are a source of tremendous complexity and befuddlement for most programmers. In particular there are two potential pitfalls in C++ that Java avoids: raw pointers and multiple inheritance. In place of pointers, Java provides true type-safe arrays and strings, as well as runtime type-checked dynamic casting.

### 5. ARE JAVA APPLETS CROSS-PLATFORM?

The Java specification actually consists of two parts, the language specification and the Java runtime environment. The language specification, like any other programming language, is independent of the platform on which it is deployed. Java's runtime environment is a byte code virtual machine (VM) interpreter that allows an applet to run on any given platform. Think of it as a simulated CPU with a platform neutral machine language.

The Java compiler compiles Java source code into Java byte code, and this byte code is executed by the virtual machine. Because the Java environment and virtual machine are platform-independent specifications and have been ported to multiple platforms, compiled Java applets are themselves platform-independent.

There are two browsers that are currently available (or are about to be available) that run Java applets. HotJava is Sun's Java-capable browser (written in Java) that runs on Solaris and Windows NT. As of this writing, beta versions of a Java-capable Netscape browser are available on Solaris, Windows NT, Windows 95, and of course Macintosh.

### 6. WILL JAVA ALLOW VIRUSES AND DESTRUCTIVE PROGRAMS TO BE TRANSMITTED VIA THE NET?

As we mentioned before, Java applets are built on AWT. AWT provides two levels of security. On the first level, AWT

Explicit web advisory

I'm not just a one night stand.

Tango  
FOR WEB DATABASES

<http://www.everyware.com/ad1/>

# SPECIAL INTERNET SECTION

Sponsored by WebEdge

prevents applets from having free access to your computer's file system. So, for example, it would be extremely difficult for someone to write a Java applet which did any damage to your computer's files. The second level of security involves a byte code verifier in the Java virtual machine. The verifier checks to see if any of AWT's security classes have been overridden or if anything in the applet will make the browser crash. If both conditions are met, it allows the non-offending applets to run in your browser. Otherwise, it rejects them. While a good concept, the verifier can be fooled; be careful.

## 7. HOW FAST IS JAVA?

The real question is, "How fast is Java in relation to other programming languages?" The answer is, Java falls somewhere in between the speed of static languages such as C/C++ and dynamic languages such as SmallTalk. Preliminary benchmarks show that Java byte codes typically execute at about 50% of the speed of well written C code for processor intensive tasks. The bottom line is that Java is significantly faster than dynamic languages such as SmallTalk and interpreted languages such as Visual Basic. The secret to Java's speed is the design of the virtual machine instruction set. The instruction set is close enough to most native CPU instruction sets that there is very little overhead in translating from Java byte codes to native instructions. Future versions of the Java byte code interpreter will be able to translate from Java byte codes to native machine code on the fly (also known as "just-in-time compilation"), which will result in even greater execution speed.

## 8. WHY DOES JAVA HAVE "AUTOMATIC GARBAGE COLLECTION" AND "MULTI-THREADING"?

OK, so that's really two questions. One of the priorities in creating the Java language was to keep the language simple. Or more specifically, the goal was to avoid a lot of the complexities of C++. One of the common complaints about coding is the work you must do to manage your memory, not to mention the consequences if you don't do it properly. Studies have shown that up to 50% of a programmer's time, when using non-garbage-collected languages such as C and C++, goes into managing memory storage. And, a significant amount of debugging time goes toward tracking down memory-related bugs.

The beauty of the Java Virtual Machine is that it takes care of memory management for you. This process is called "automatic garbage collection." A low-priority thread periodically scans your applet's memory for unused objects and recycles the memory they were using. It does this by keeping track of what parts of your program are using memory, and determining when those chunks of memory are no longer needed. Many programmers mistakenly think that garbage collection is inherently slower than manual memory management. This impression stems from the fact that up until now, most mainstream languages that used garbage collection were interpreted and thus inherently slow themselves. In fact, a well-implemented garbage collector is on average as fast if not faster than the best implementation of manual memory management. A well-implemented garbage collector can be faster than manual memory management because it can reclaim unused memory in one fell swoop instead of in hundreds of small increments.

As for multi-threading, we just saw one very good use of multiple threads. Aside from garbage collection, today's fast microprocessors can easily support multiple threads of execution, allowing more flexible and robust solutions to many classical programming problems. For example, any asynchronous task, which requires polling of a state flag, can be spun off into a separate thread allowing the main thread of execution to continue unabated without worrying about the result of the task.

## 9. WHAT IS THE FUTURE FOR JAVA ON THE MACINTOSH?

As we mentioned above, Netscape is planning to release a Macintosh version of its browser that is Java-capable. Programming in Java on the Macintosh is a different story altogether. There are currently two options. As of this writing, Sun is planning on releasing a Macintosh version of their Java Development Kit in early 1996. By the time you read this article, Developer Release 1 of Roaster™, the other option on the Macintosh, will be shipping. No discussion of Java in a Macintosh programming magazine would be complete without mention of Roaster. However, Roaster is a product from our company, Natural Intelligence, so I'll keep the marketing to a minimum and give you the basics.

Roaster is an integrated development environment for writing Java applets. Roaster consists of several components:

Explicit web advisory

I'm up for anything.

Tango  
FOR WEB DATABASES

<http://www.everyware.com/ad2/>

# SPECIAL INTERNET SECTION

Sponsored by WebEdge

## Project Window

This is used for the organization of your source code and compiled byte codes in a Finder-like view.

## Source Code Editor

The editor includes a toolbar with a full suite of code-editing functions, context-sensitive color and style syntax formatting, and drag and drop support.

## Runtime Engine

This allows you to put up a native window in which you can test your applets.

## Compiler

The compiler generates Java byte codes.

We're including this description in the article to give you an idea of what will be in Natural Intelligence's Macintosh applet development environment for Java. But hopefully, Sun's environment will be out soon, so that you will have more than one option for developing in Java on the Macintosh. *[Metrowerks has announced support for Java development as well. See Newsbits. - Ed. Asst. jtk]*

## 10. WHERE CAN I GET MORE INFORMATION?

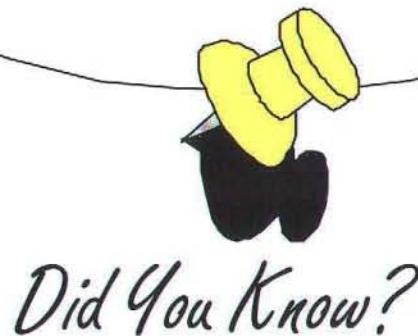
I always balk at putting references to the net in articles that won't be published until weeks after they're written. The net is so dynamic that they may end up being out of date. So cross your fingers and check out these resources. Most should still be relevant by the time you read this, though I'm sure that there will be many more by the time this is published.

Java Home Page	<a href="http://java.sun.com/">http://java.sun.com/</a>
John December presents Java	<a href="http://www.rpi.edu/~decemj/works/java.html">http://www.rpi.edu/~decemj/works/java.html</a>
Java Jive	<a href="http://catalog.com/dddu/javajive.html">http://catalog.com/dddu/javajive.html</a>
Natural Intelligence, Inc.	<a href="http://www.natural.com/">http://www.natural.com/</a>
Gamelan Java Resource Registry	<a href="http://www.gamelan.com/">http://www.gamelan.com/</a>
Java Usenet Newsgroup	<a href="news:comp.lang.java">news:comp.lang.java</a>
Java-Mac mailing list	send "subscribe java-mac" to <a href="mailto:majordomo@natural.com">majordomo@natural.com</a>

These are just a few of the resources out there. Keep your eyes peeled for the inevitable avalanche of books and magazine articles on the subject.

## SUMMARY

In closing, despite your natural reaction (as a marketing savvy programmer) to dismiss the hype surrounding Java, there really is something to get excited about. While Java has its limitations, it is a definite leap ahead of today's industry standard programming languages and approaches. With your support of the language, there is no doubt that Java will continue to thrive in the future.



*Did You Know?*

*You can have full code listings every month with a disk subscription. See the Mail Order Store section for rates.*

*Call, fax, or write to order your disk subscription.*

*See How to Communicate with Xplain Corporation on page 2 for contact info.*

Explicit web advisory

I like the group thing.

Tango

FOR WEB DATABASES

<http://www.everyware.com/ad3/>

# SPECIAL INTERNET SECTION

Sponsored by WebEdge

FROM  
THE FACTORY  
FLOOR

By Dave Mark



## Java Talk

You, the MacTech readership, have been long asking for a Metrowerks presence in the magazine. This is the first in a brand new series of articles by longtime MacTech columnist Dave Mark. Dave recently joined forces with Metrowerks to produce a series of CD-ROM based programming products. This month, Dave interviews Greg Galanos, president and CEO of Metrowerks, about Metrowerks' recent announcement on their new Java development environment.

**Dave:** Metrowerks just announced the first Mac-based Java development environment. What can you tell me about it?

**Greg:** We've been tracking Java for over a year now, noting the developments in the field and the positioning of the language with respect to Internet development. A little over four months ago, we initiated contact with Sun and developed a complementary position in order to properly support Java programming and Internet development within CodeWarrior.

The Sun deal was signed a couple of days before Comdex. It is both a licensing and a development deal where Metrowerks will license compiler technology, runtime interpreters, Java classes that support cross platform development, as well as the HotJava browser. These technologies will be seamlessly merged with the CodeWarrior Development Environment in order to

bring them to our user base as a first developer release in May. This means we'll support source-level debugging, browsing and compiling as if you were working with C/C++ or Object Pascal within the IDE.

**Dave:** If you want to produce Java applets, you'll have to learn the Java programming language, something akin to learning C++. Do you think Metrowerks will ever offer a way for non-programmers to produce Java applets?

**Greg:** Ahh, the holy grail.... Metrowerks is committed to building better, easier-to-use tools. I suppose the cryptic response would be to say that we will support Java in much the same way that Borland will support Java.... The answer here is that we will strive to do so but it's not a short-term proposition. This will take time, but yes, we are moving quickly towards that goal and will be taking Constructor down that road.

**Dave:** What is Sun's role in all this?

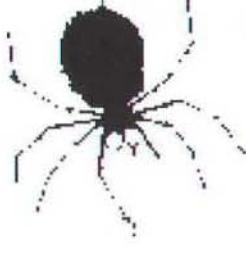
**Greg:** Sun has been working on different manifestations of Java for about 5 years. It came out of some pretty serious R&D efforts into embedded appliance systems. It was found at that time that C++ was not ideal for embedded, secure development because of what Sun calls unsafe language features: pointers, operator overloading, multiple inheritance and the absence of garbage collection. (Note: multiple inheritance is available in the Java interface, but not in the classes themselves). Java is a language that is very close to C++ without the features that are considered insecure or dangerous, especially for a language designed for building programs that are downloaded to your desktop machine and which will then run there.

Sun is doing some very interesting things in order to nurture Java and cross-platform Java implementation. For instance, they are licensing their technology and working with strategically chosen desktop partners in tools (Metrowerks, Borland), communications (Netscape, Spyglass), content development (Macromedia, others). But they are also

# SPECIAL INTERNET SECTION

Sponsored by WebEdge

## World Wide Web Weaver™ for Macintosh



The professional web page development tool

- Tables
- Forms
- Page Colors
- Add your own tags
- And much more!



For a *fully* functioning demo, point your web browser to <http://www.northnet.org/best/>

Best Enterprises (315) 265-0930

controlling the technology and the language standard until the language is embedded, so to speak, in Internet development in order to stave off the featuritis that comes from standards committees (I point to C++ as a specific example of this). This is a good thing — actually the reverse of what usually happens with a new language.

Finally, Sun is controlling and furthering the security technology that will guarantee that a Java applet is, in effect, secure. Part of the technology licensed from Sun addresses the areas of security and validation, what is applied to the Java byte code stream once it passes the threshold of your particular desktop machine.

Metrowerks and Sun have teamed up to ensure that Macintosh plays an important role in Java development. This relationship is both one of making the tools available to our customers in a timely manner (WWDC) and also working with Sun on market-creation strategies. MW has licensed all the Sun technology and will be rolling new technology into its Java products as time progresses. Of course, Metrowerks will also be developing new technology for Java, optimization techniques for runtime improvements, AWT (abstract windowing toolkit) support, interface building tools, etc. This is a long term play for us and we intend to support our customers in their quest to program the net and increase their own revenues.

**Dave:** Will developers have to pay any royalties on applets they build using JavaWerks? Are there any licensing issues developers need to be aware of?

**Greg:** Wow, "JavaWerks"! Quick, let's get a trademark! Seriously though, applet developers shouldn't have to worry too much about licensing issues unless they are also shipping the byte code interpreters. Sun is striving to make this technology an open platform; therefore there are no direct royalties or other costs associated with developing and shipping applets. Java implementers such as Metrowerks and the other Java official licensees bear the burden of the royalties in a distributed manner, so it makes a lot of sense from a developer's standpoint. The implementers are held to a very high standard and must pass all sorts of validation suites before shipping their toolsuite. This is because Sun absolutely wants Java to be cross-platform, and for this to be achieved much more validation must be applied to the tools to ensure that the compilers generate the proper byte code for any particular release.

**Dave:** What impact do you think Java applets will have on more mainstream application development? For example, do you think we'll ever see a Java word processor or spreadsheet applet? If so, how will folks pay for it?

**Greg:** I think there are really two markets here. The first is the development of applets or small applications that live on a Web server and execute a specialized function that an end-user wants to acquire. I'll take the easy example: Imagine a specialized applet that implements peer-to-peer communication with a stock quote server (local Java applet talks to remote Java applet) and warns you when you should buy or sell. An end user is likely to see value in this applet and be prepared to pay a price of (let's say) \$9.95 a month for this service. Result: applet developer sells to end-user without traditional distribution channel. There are many, many examples of this from gardening, to cooking, to special travel deals, that a consumer will be interested in procuring in the home directly from the service provider.

The second market is for today's applications vendors (our customers) to hotwire their application to the Internet either by implementing applets in their application suite that can be sent off across the net to "do something" or by embedding applet technology in their application to host applets that are downloaded from the net. This could be as simple as running the applet in a web browser, or as complicated as allowing the applet to actually "plug in" to the application itself. Again, the consumer could then choose from any specialized applet that is destined to work with ClarisWorks or FreeHand or Illustrator, to give a few examples. Look at the Java runtime model as a very lightweight, multi-threaded container architecture without SOM and the fragile base class problem that happens to be the Achilles' heel of C++. This is a powerful concept.

# SPECIAL INTERNET SECTION

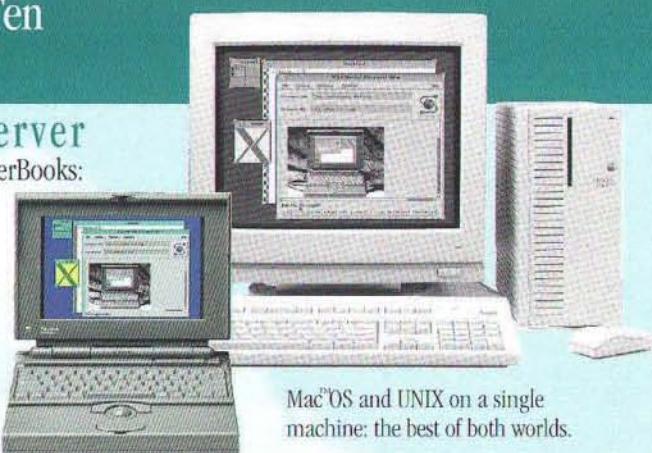
Sponsored by WebEdge

## Hang Ten with Mach<sup>Ten</sup>

### Make Your Macintosh An Internet Server

Mach<sup>Ten</sup> gives every Macintosh from Classic to PowerMac & PowerBooks:

1. Unlimited Web 'Home' Pages
2. Unlimited TCP Connections
3. Unlimited Mail Accounts
4. Unlimited Internet Addresses
5. Unlimited Domain Names
6. Domain Name Service (DNS)
7. POP Mail Service
8. Mac/UNIX File Sharing
9. Mac/UNIX Printer Sharing
10. Unlimited Possibilities



Mac<sup>OS</sup> and UNIX on a single machine: the best of both worlds.

Mach<sup>Ten</sup> is a compact UNIX operating system that runs seamlessly with the Macintosh operating system to let your Mac reach its full potential.

For more information, or to order call

**1-800-6-MACH-10**

Internet: [info@tenon.com](mailto:info@tenon.com) <http://www.tenon.com>



Tenon Intersystems

1123 Chapala Street, Santa Barbara, CA 93101

Tel: 805-963-6983 Fax: 805-962-8202

©1995 Tenon Intersystems. The Tenon Intersystems name and Mach<sup>Ten</sup> are trademarks of Tenon Intersystems. Macintosh, Classic, PowerBook, Power Macintosh and Duo are registered trademarks of Apple Computer, Inc. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited.

**Dave:** Java is normally compiled into byte-code, then interpreted. Will there ever be a fully compiled Java with no interpreter in the loop?

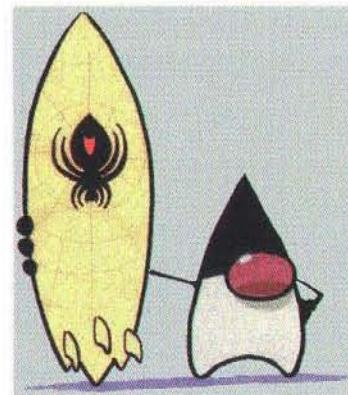
**Greg:** Essentially, the byte code runs on the Java virtual machine (the interpreter) which translates the byte-code into native instructions. I think you'll see both just-in-time compilers and hybrid dynamic/intepreted compilers that will be necessary to speed up local execution. So the answer is Yes. The real question is: "When?"

**Dave:** Where can people go to get more information?

**Greg:** Well, the fastest way to get to all the hot Java sites is to go to <http://www.metrowerks.com>. We have a full hookup to licenses sites, user sites, Sun's numerous sites. The other place you can go is to <http://java.sun.com> (but we point there too!). There's also the newly created newsgroup <news:comp.lang.java> which has nearly as much traffic as [comp.sys.mac.programmer.codewarrior](news:comp.sys.mac.programmer.codewarrior). The Java newsgroup is nearly absent of Mac programmers, who have not had the tools to date. We definitely are going to change this. You can also send email to [java@metrowerks.com](mailto:java@metrowerks.com) to receive info on beta testing.

**Dave:** Who the heck is Duke, and why is he stealing Arnold's limelight?

**Greg:** Hey, Duke's cool. He's the Java mascot, a molar-shaped imp with a red nose carrying a surfboard. I can just see Arnold surfing the web jolted out of his brain on this Java stuff. Arnold and Duke are buddies. Arnold is Duke's protector. Like Terminator II, yeah.



# SPECIAL INTERNET SECTION

Sponsored by WebEdge

INTERNET  
SOLUTIONS



By Brad Schrick and Eric Bickford

## Becoming a Macintosh Service Provider

### Tales from the field

For several months *MacTech* has published articles explaining how to configure and program Internet WWW servers. Of course, Macintosh Web development isn't just programming; there's money to be made! Eric Bickford and Brad Schrick, two professional Macintosh WWW developers, report on market conditions. The forecast is sunny.

#### ERIC BICKFORD

It began innocently enough. Put up a few web pages and see what happens. Seven months later the Mac Web Consultants Directory <http://www.macweb.com/> had received listings from 440 consultants in 20 countries throughout the world (80% of those in the USA).

The Mac Web Consultants Directory was launched in April 1995 at WebEdge I, the Macintosh WWW Developers Conference. The idea behind the Directory was simple: Provide a searchable database of consultants who are experts in electronic publishing on the World Wide Web using Apple Macintosh and compatible computers.

#### Listing

To register, a consultant need only complete a free online application form. The application form asks for contact information and a short description of the services the consultant offers. This description becomes the consultant's primary vehicle for attracting clients who search the Directory.

The application form also has a skills matrix for Services, Scripting Languages, Database Programs, and Web Tools. Any individual consultant might be skilled in CGI programming using AppleScript, C++, or Frontier. They might be skilled with a Macintosh database like 4th Dimension, Butler, or FileMaker Pro. Or, they are skilled in a specific web-related tool like AppleSearch or NetCloak.

Once a consultant creates a profile, they have the capability to update their profile at any time. Should a consultant be unavailable, for example, they're encouraged to update their availability status to "Booked Solid".

#### Searching

The Directory's web-based search screen is very simple: Select the field you wish to search, such as "City", and enter a search term. Results of a search are returned as a hitlist of records with consultant contact and profile information. Small icons on each consultant profile give an indication of the special skills that a consultant might offer.

The individual consultant must sell himself. Each listing in the Directory should have a URL pointing to the consultant's home page. The quality of a consultant's home page is often the primary selling point for acquiring new projects.

#### It Actually Works

Large and small companies and organizations use the Directory to find experts to help them build mission-critical, industrial-strength

**Brad Schrick and Eric Bickford** – Brad Schrick is a consultant in Palo Alto, CA. Eric Bickford is the author of Web-FM and a product development engineer for the Web Broadcasting Co. in Palo Alto, CA.

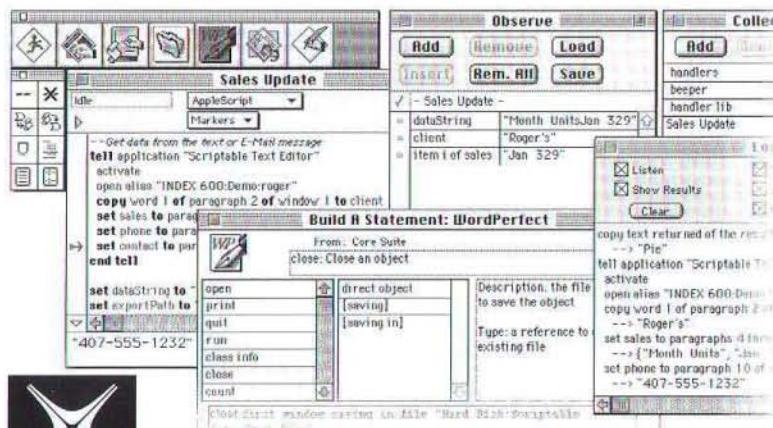
# SPECIAL INTERNET SECTION

Sponsored by WebEdge

The #1 debugging and development environment for AppleScript™!



- Real step-by-step debugging
- Variable watcher & expression evaluator: set variables, in context, during debugging!
- Enhanced trace log
- FaceSpan™ link
- Vocabulary access in a mouseclick
- Power-assisted statement construction
- Multifunction find & replace
- Automatic navigation to subroutines
- Background processing



1 800 616 8320 ORDERS ONLY

If you're an AppleScript novice, Scripter will take you by the hand and show you the correct syntax for your statements. If you know what you're doing, Scripter will help you do it faster than any other editor. Scripter lets you debug properly: truly line-by-line, so you catch the offending code in the act. And only in Scripter can you then fix the problem, and continue debugging — right from where you left off. In fact, Scripter has so many exclusive features, we can't list them all here. So get a copy today, and start scripting with power!

## "Overall value ◆◆◆◆◆"

**Scripter 1.0 is top AppleScript editor and debugger... If you expect to do anything more than idle fiddling with AppleScript, you need Scripter." — MacWeek, 6/12/95**

solutions on the WWW. It's rewarding when you plan and build something like this Directory and it actually works. Again and again I find I'm talking to or reading email from someone in the directory who mentions getting a project or referral from it.

The Directory, however, isn't without some problems. Because listing as a consultant is free, some people have listed themselves who arguably should not be in the Directory. For example, a quick search of the Directory finds that not all consultants have a home page URL. Likewise, an even 10% of all consultants listed have an email address with an .edu university top-level domain.

### BRAD SCHRICK

In mid-1993 Chuck Shotton wrote MachHTTP, and showed that a Macintosh could be a competent server on the World Wide Web. By late 1994 there was a lively group of commercial, educational, and personal Mac OS WWW servers using MachHTTP on the Web.

### Show me

However, despite these many examples and an active discussion list, even Macintosh advocates often believed that UNIX was required to serve pages on the WWW. Instead of arguing endlessly, Brad Schrick, a MachHTTP advocate and

customer, decided to try to list the servers that use Mac OS to deliver World Wide Web services.

### The list debuted in October 1994

The first listings were easy to choose, starting with Chuck's site on his IIci at the University of Houston (now [www.biap.com](http://www.biap.com)), Apple's front door, tended by Dale Mead at [www.apple.com](http://www.apple.com) on a Mac IIfx, Stephen Collins's Web66 'WWW cookbook' at [web66.coled.umn.edu](http://web66.coled.umn.edu) (with several other Mac WWW sites), Jon Wiederspan's CGI tutorial (<http://www.uwtc.washington.edu/computing/www/lessons/>) at the University of Washington, and about 50 others.

Over the past year, the lists were automated to allow Mac webmasters to enter and change their own listings, and the lists were grouped by new listings, geography, equipment, and software in a continuing process to help Mac webmasters evaluate techniques and markets for their work.

The Mac WWW Server lists at <http://brad.net/macwww/> currently hold about 1100 listings for about 900 to 1000 distinct Mac servers from around the world, and are growing at a pace

*Continued on page 94*

# SPECIAL INTERNET SECTION

Sponsored by WebEdge

INTERNET  
SPECIAL

By Alan B. Oppenheimer



## Inside HomeDoor

### ***Make one web server act like a network of servers***

The HomeDoor™ Default Home Page Server is a newly-announced product from Open Door Networks. HomeDoor enables a single Macintosh Web server to serve default home pages for multiple domains. This article describes the inner workings of HomeDoor.

#### **PRODUCT SUMMARY**

HomeDoor is a Macintosh extension and associated Admin application which enables an Ethernet-based Macintosh to redirect requests for particular default home pages to particular subdirectories on any Web server. For example, HomeDoor can redirect URLs of the form <http://www.companyX.com/> to the form <http://www.yourwebserver.com/companyX/>. HomeDoor supports up to 256 such redirections, allowing you to set up a large number of default home pages on a single MacOS-based Web server. HomeDoor also supports the creation of complete "virtual" domains associated with each of these home pages.

The Web server (or servers) to which

HomeDoor redirects requests do not necessarily have to be in the same machine, or even on the same network, as HomeDoor. You configure HomeDoor with a unique IP address for each default home page it is going to serve. You will also generally want to assign a domain name, such as [www.companyX.com](http://www.companyX.com), to each of these addresses. For each address, you then configure HomeDoor with the URL to redirect that address to. When HomeDoor gets an HTTP request to one of the addresses it's managing, it redirects that request to the configured URL. HomeDoor can be used to serve default home pages in this manner, and also to serve full "virtual" domains, redirecting not only URLs of the form <http://www.companyX.com/>, but also URLs of the form <http://www.companyX.com/file-or-directory>. When redirecting such URLs, HomeDoor preserves the "file-or-directory" part, thus supporting the creation of complete virtual domains.

#### **MULTIHOMING – THE KEY TO HOMEBOOK**

The key architectural component of HomeDoor is *multihoming*. Multihoming is the ability of a single physical node on a network to have more than one address (or "home") on that network. Neither MacTCP nor the TCP/IP implementation in Open Transport provides multihoming, although Apple intends multihoming to be a feature of Open Transport 2.0. HomeDoor thus had to implement a simple form of multihoming itself. HomeDoor's multihoming is limited to those Internet protocols required for HTTP (specifically ARP, IP and TCP), plus a small subset of ICMP so that HomeDoor can respond to pings for its addresses. HomeDoor does not provide a general-purpose implementation of multihoming.

HomeDoor's multihoming is implemented directly on top of the Macintosh Ethernet driver, below the TCP/IP stack.

**Alan B. Oppenheimer** – Alan B. Oppenheimer was part of the original team that created the AppleTalk network system. Alan was responsible for the design of many of AppleTalk's lower layer protocols and led the team at Apple responsible for the Apple Internet Router and Apple Remote Access. Alan left Apple to found Open Door Networks, Inc. in January of 1995. Alan's email address is [alan@opendoor.com](mailto:alan@opendoor.com).

# SPECIAL INTERNET SECTION

Sponsored by WebEdge

HomeDoor tells the Ethernet driver to pass it all packets of Ethernet type "ARP" or "IP." Because of the way the IP protocol suite works, the packets HomeDoor needs to receive are either broadcast (ARP packets), or sent directly to the Macintosh's Ethernet address (IP packets). This fact is important, because it prevents HomeDoor from needing to have the Ethernet driver listen to every packet sent on the network, which would adversely affect performance.

After being passed an ARP or IP packet from the Ethernet driver, HomeDoor determines if the packet is intended for an address in its address range. If the packet is in range, HomeDoor processes the packet as appropriate, implementing the required parts of ARP, IP, TCP or ICMP. If the packet is not in HomeDoor's address range, and MacTCP is running, HomeDoor passes the packet to MacTCP. Otherwise HomeDoor discards the packet. By passing packets to MacTCP, HomeDoor can run on the same Macintosh as any MacTCP client or server, and specifically in the same Macintosh as a Web server for which it is serving default home pages. HomeDoor does not, however, require MacTCP to run. HomeDoor also will not currently run at all on a Macintosh which is running Open Transport, due to OT's radically different driver architecture.

## Redirection

As shown below in figure 1, HomeDoor takes advantage of a feature in HTTP known as redirection. A browser wishing to look at a Web page issues an HTTP GET command to the address indicated by the first part of the URL, after obtaining that address from a domain name server (DNS). If the address is being managed by HomeDoor, HomeDoor receives the request and returns an HTTP REDIRECT in response. The REDIRECT contains the actual URL of the associated default home page. The browser receives the REDIRECT and then requests that page directly from the actual server, using the new URL. From then on, the browser talks directly to the Web server if other (relative) links on that server are accessed.

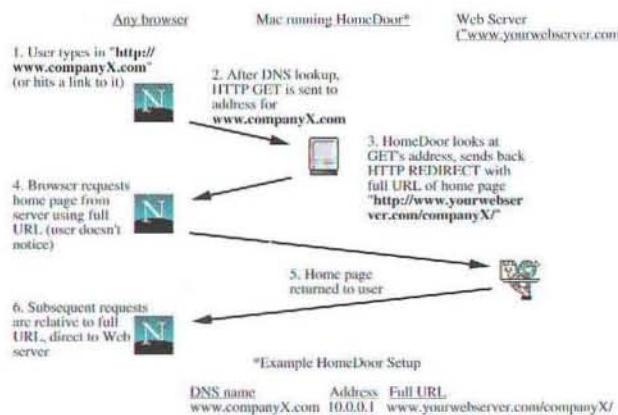


Figure 1. How HomeDoor works



## The Macintosh WWW Developers Conference

### WebEdge at Macworld

*Featuring cutting edge advice  
from leading Web experts  
and developers*

How to Build Your Own WWW Server  
Without Really Trying • Commercial CGIs:  
Connecting Your WWW Server to Back-End  
Applications • WWW Site Management and  
Performance: Tips, Tricks, RAICs, and  
System Administration • CGI Programming:  
Getting Under the Hood • New Web Technologies

January 9-12  
San Francisco

[info@lists.webedge.com](mailto:info@lists.webedge.com)  
<http://www.webedge.com/>

# SPECIAL INTERNET SECTION

Sponsored by WebEdge

## Virtual domains

To be precise, HomeDoor actually does more than simply returning, in the REDIRECT, the URL that has been configured for the address requested. Technically speaking, HomeDoor actually replaces the part of the URL which specifies the Web server itself with the URL to be returned. So a URL of the form <http://www.companyX.com/> is returned as <http://www.yourwebserver.com/companyX/>, but a URL of the form <http://www.companyX.com/file-or-directory> becomes <http://www.yourwebserver.com/companyX/file-or-directory>. Since the "file-or-directory" part can in fact be arbitrarily long, a full "virtual" domain can be served by HomeDoor.

## Completing the illusion

HomeDoor effectively allows a single Macintosh Web server to serve default home pages, and in fact full virtual domains, for up to 256 different domain names. HomeDoor does so in a manner that is almost totally transparent to Web browsers. The only significant exception is that most browsers display a page's actual URL in their "location" field. Thus, for example a browser user would see the URL <http://www.yourwebserver.com/companyX/>, even though they typed in or accessed the URL <http://www.companyX.com>. Even this minor side-effect, however, can be eliminated by using a DNS to set up an appropriate alias to the actual Web server, and using HomeDoor to redirect to that alias as opposed to the Web server itself. For instance, instead of redirecting <http://www.companyX.com> to <http://www.yourwebserver.com/companyX/>, you could redirect it to <http://www2.companyX.com/companyX/>, where [www2.companyX.com](http://www2.companyX.com) is an alias for [www.yourwebserver.com](http://www.yourwebserver.com). In this way, not only will the Web browser user see the correct domain name in the "location" field, but it will appear to the user that the domain in question has not one but two complete Web servers associated with it ([www.companyX.com](http://www.companyX.com) and [www2.companyX.com](http://www2.companyX.com)).

## Subtleties of HomeDoor

The HomeDoor design contains a number of subtleties which might not be immediately apparent. These subtleties are based on the fact that HomeDoor allows you to enter a full URL for each address it is managing. This flexibility allows, for instance, a single HomeDoor server to serve home pages and virtual domains for more than one Web server. And, although HomeDoor runs on a Macintosh, there is no reason that the Web servers themselves need to be Macintoshes. HomeDoor can serve default home pages for any type of Web server whatsoever. HomeDoor can also redirect URL's to other network services, allowing, for instance, an HTTP URL to be redirected to an FTP server. Finally, with some small modifications, the HomeDoor architecture can be enhanced to provide many additional services. One area for immediate investigation involves having HomeDoor redirect a particular

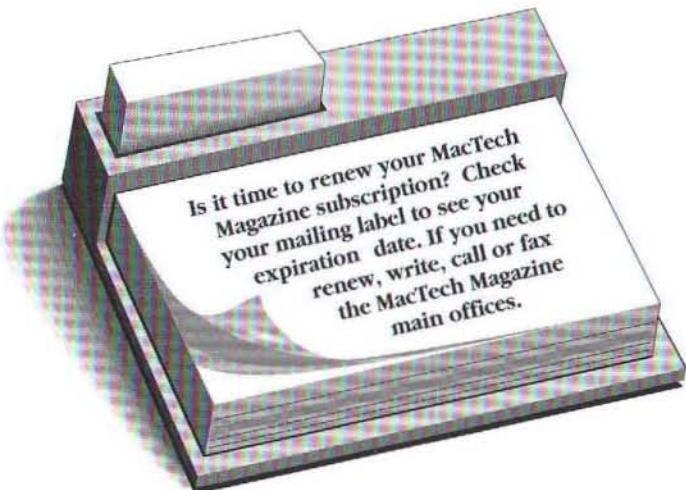
URL to a URL chosen randomly or sequentially from a group of other URLs, enabling HomeDoor to serve as the front end to a Redundant Array of Inexpensive Computers (RAIC).

## How To Find Out More

Open Door Networks maintains a complete set of home pages on the HomeDoor product. Not only do these pages include product details, example pages served by HomeDoor and a full copy of the HomeDoor Users' Guide, but also a downloadable evaluation version of the current release of HomeDoor. The HomeDoor pages are at <http://www.opendoor.com/homedoor/>. General information on Open Door Networks, one of the first Macintosh-based Internet service providers, is available at <http://www.opendoor.com>. Specific questions should be addressed to [help@opendoor.com](mailto:help@opendoor.com).

*[For those of you that would like to see a real life example of this technology, we use HomeDoor on one of our servers in the Xplain Corp./MacTech offices. In fact, the [www.mactech.com](http://www.mactech.com) and [www.decentral.com](http://www.decentral.com) web sites are redirected using HomeDoor. This allows us to have an all Macintosh Internet site without having to resort to Unix. We're very pleased with this solution.]*

*[There are some minor limitations to the way that HomeDoor works (although it does benefit from an all Macintosh user interface). If you want a different solution, Unix does offer the most complete "multi-homing" solution available. And, if you want to stay with the Macintosh (and why wouldn't you?), then MachTen from Tenon is your answer – it's a kinder, gentler Unix. :) – Pub. ns]*



# SPECIAL INTERNET SECTION

Sponsored by WebEdge

## INTERNET DEVELOPMENT

By Mason Hale <hale@onr.com>



# CGI's: AppleScript or Frontier?

### *Comparing scripting environments for CGI development*

In a previous article, "Scripting the Web with Frontier", I introduced you to writing CGI scripts using UserLand Frontier. In that article, I argued that Frontier was an excellent alternative for webmasters who felt forced to choose between the poor performance of AppleScript and the steep learning curve of C because Frontier is easier to use than C yet generally performs faster than AppleScript, especially when used to create CGI applications. That argument became even more true when a PowerPC-native Frontier was released for public beta-testing in late October. Like dropping a bigger engine into a hot rod, script execution instantly becomes much faster – in some cases up to six times faster. With this boost in speed on PowerPC machines, Frontier is closing the gap on C – offering both ease-of-use and excellent performance – while further increasing its lead on AppleScript.

Despite the proven benefits of using Frontier to write CGI applications, many webmasters still are developing their CGIs in AppleScript. This inspired me to look a bit more closely at the differences

between CGI applications written in Frontier and those in AppleScript, primarily focusing on performance issues. In this article I will share the results of some of my recreational performance testing, and explain some of the different situations that affect performance.

Since I am the author of the Frontier CGI Framework, a set of scripts that enhance CGI development in Frontier, you could understandably question my objectivity in doing such a comparison. On the other hand, since I have done a great deal of CGI development in both environments, I am also one of the few people qualified to do such a comparison. In either case it is not my intent to discount AppleScript as a scripting environment. I think it is a great product and an important technology. I just don't believe it is well-suited to the specific task of CGI development.

#### PERFORMANCE

Performance is crucial to CGI applications running on busy servers. The more processing time a request takes, the more likely a user is to give up and move on to another site.

I've often been asked if Frontier is faster than AppleScript. The truth is, when comparing built-in verbs in AppleScript and the non-native version of Frontier, the performance is surprisingly similar. I ran a series of informal tests to compare the performance of AppleScript, non-native Frontier and native Frontier when running equivalent scripts. The scripts are based on the sample scripts from Frontier's object database. All tests were run on a Power Macintosh 7200/75 with 16 MB RAM. Execution time is measured in ticks (sixtieths of seconds).

The first test script performs simple integer arithmetic using built-in commands in both the AppleScript and UserTalk versions. The actual scripts are functionally identical.

```
set x to 0
repeat with i from 1 to 1000
```

Test 1: Integer Arithmetic (AppleScript)

**Mason Hale** – Mason Hale is Director of Internet Services for VersaCom, Inc. – an Austin, Texas-based on-line communications and Internet marketing firm. He is the author of the Frontier CGI Framework and President of the Capitol Macintosh Users Group.

# SPECIAL INTERNET SECTION

Sponsored by WebEdge

```
set x to x + (12 + 99 - 37 / 84)
end
```

Test 1: Integer Arithmetic (UserTalk)

```
x = 0
for i = 1 to 1000
  x = x + (12 + 99 - 37 / 84)
```

AppleScript took 111 ticks to complete the first test, while the non-native Frontier took 103 ticks. The PowerPC-native Frontier ran the same script in just 17 ticks. This first test really shows how close the non-native Frontier and AppleScript were – and the tremendous difference the native version makes.

The second test demonstrates the repeated calling of a local subroutine.

```
set y to 10
on moof (x)
  return (x * 2)
end
repeat with i from 1 to 1000
  set y to moof (y)
end
```

Test 2: Subroutine Call (AppleScript)

```
y = 10
on moof (x)
  return (x * 2)
for i = 1 to 1000
  y = moof (y)
```

Test 2: Subroutine Call (UserTalk)

AppleScript blew the doors of the non-native Frontier in the second test coming in at 85 ticks to Frontier's 272 ticks. However, the PowerPC-native Frontier handily won with a time of 47 ticks.

The third script compares the performance of commands from an external Scripting Addition to a built-in Frontier verb. I compared the speed of Frontier's built-in `clock.now` verb to the equivalent current date Scripting Addition.

```
for i = 1 to 100
  y = clock.now ()
```

Test 3: Built-in verb vs. Scripting Addition (UserTalk)

```
repeat with i from 1 to 100
  set y to current date
end repeat
```

Test 3: Built-in verb vs. Scripting Addition (AppleScript)

It took AppleScript 113 ticks to complete this test, while the non-native Frontier took 17 ticks and the native Frontier took 5 ticks. This illustrates a crucial point in determining the speed of a script. Built-in commands are faster than commands loaded from external code fragments. Because AppleScript has few built-in verbs and relies heavily on Scripting Additions to extend the language, the use of external commands like "current date" is quite common.

In the fourth example the script checks the existence of a file. Frontier uses a built-in verb "file.exists", while AppleScript communicates with the scriptable Finder via AppleEvents.

```
set x to 0
```

Test 4: Built-in verb vs. Apple Event (AppleScript)

```
tell application "Finder"
repeat with i from 1 to 10
  if exists alias "Macintosh HD:SimpleText" then
    set x to x + 1
  end if
end repeat
end tell
```

Test 4: Built-in verb vs. Apple Event (UserTalk)

```
local (x = 0)
for i = 1 to 10
  if file.exists ("Macintosh HD:SimpleText")
    x++
```

Inter-application communication can really slow things down. Each cross-application Apple Event adds approximately 1/4 second to the processing time of the script. Frontier suffers the same slowdowns when sending Apple Events to other applications, but because more commands are available, external applications are relied on less often.

The results of the fourth test bear this out. While the native and non-native Frontier applications finished in 3 ticks and 7 ticks respectively, AppleScript took 140 ticks to perform the same task using the scriptable Finder.

My final test was "real world" example, based on the "test.cgi" script that is distributed with MacHTTP. This script uses no scripting additions and doesn't perform any cross-application communication. So it is a pretty good example of a common CGI script using built-in verbs.

Test 5: Test CGI (AppleScript)

```
property crlf : (ASCII character 13) & (ASCII character 10)
```

-this builds the normal HTTP header for regular access

```
property http_10_header : "HTTP/1.0 200 OK" & crlf &
  "Server: MacHTTP" & crlf & "MIME-Version: 1.0" &
  crlf & "Content-type: text/html" & crlf & crlf
```

```
on cgiScript (path_args, http_search_args, username, □
  password, from_user, client_address, server_name, □
  server_port, script_name, content_type, referer, □
  user_agent, action, action_path, post_args, method, □
  client_ip, full_request)
```

try --wrap the whole script in an error handler

```
return http_10_header & "<title>Test CGI</title>" &
  "<h2>Test CGI</h2><u>CGI arguments sent:</u>" &
  "<br><b>path:</b> " & path_args &
  "<br><b>search:</b> " & http_search_args &
  "<br><b>post_args:</b> " & post_args &
  "<br><b>method:</b> " & method &
  "<br><b>address:</b> " & client_address &
  "<br><b>user:</b> " & username &
  "<br><b>password:</b> " & password &
  "<br><b>from:</b> " & from_user &
  "<br><b>server_name:</b> " & server_name &
  "<br><b>server_port:</b> " & server_port &
  "<br><b>script_name:</b> " & script_name &
  "<br><b>referer:</b> " & referer &
  "<br><b>user agent:</b> " & user_agent &
  "<br><b>content_type:</b> " & content_type & crlf
```

on error msg number num

```
  return http_10_header & "Error " & num & ", " & msg
end try
```

end caller

```
repeat with i from 1 to 10
  cgiScript ("aaa", "bbb", "ccc", "ddd", "eee", □
    "fff", "ggg", "hhh", "iii", "jjj", "kkk", □
    "lll", "mmm", "nnn", "ooo", "ppp", "qqq", "rrr")
end repeat
```

# SPECIAL INTERNET SECTION

Sponsored by WebEdge

## Test 5: Test CGI (UserTalk)

```
on cgiScript (pathArgs, httpSearchArgs, username, \
password, fromUser, clientAddress, serverName, \
serverPort, scriptName, contentType, referer, \
userAgent, action, actionPath, postArgs, method, \
clientIp, fullRequest)

try
    return (webServer.httpHeader () + \
    "<title>Test CGI</title><h2>Test CGI</h2>" + \
    "<u>CGI arguments sent:</u>" + \
    "<br><b>path:</b> " + pathArgs + \
    "<br><b>search:</b> " + httpSearchArgs + \
    "<br><b>post_args:</b> " + postArgs + \
    "<br><b>method:</b> " + method + \
    "<br><b>address:</b> " + clientAddress + \
    "<br><b>user:</b> " + username + \
    "<br><b>password:</b> " + password + \
    "<br><b>from:</b> " + fromUser + \
    "<br><b>server_name:</b> " + serverName + \
    "<br><b>server_port:</b> " + serverPort + \
    "<br><b>script_name:</b> " + scriptName + \
    "<br><b>referer:</b> " + referer + \
    "<br><b>user_agent:</b> " + userAgent + \
    "<br><b>content_type:</b> " + contentType + cr + lf)
else
    return (webServer.httpHeader () + "Error " + tryError)

local (i)
for i = 1 to 10
    cgiScript ("aaa", "bbb", "ccc", "ddd", "eee", "fff", "ggg", \
    "hhh", "iii", "jjj", "kkk", "lll", "mmm", "nnn", "ooo", \
    "ppp", "qqq", "rrr")
```

As expected, the AppleScript and non-native version of Frontier performed similarly. The AppleScript CGI test finished in 69 ticks, beating out Frontier at 74 ticks. Native Frontier won again with 14 ticks. A summary of the timing results for all tests is shown in Table 1.

	AppleScript	Frontier 68K	Frontier PPC
Integer Arithmetic	111	103	17
Subroutine Call	85	272	45
Built-in vs. OSAX	113	17	5
Built-in vs. AE	140	7	3
Test CGI	69	74	14

Table 1. Comparison of execution times (all times in 1/60 second)

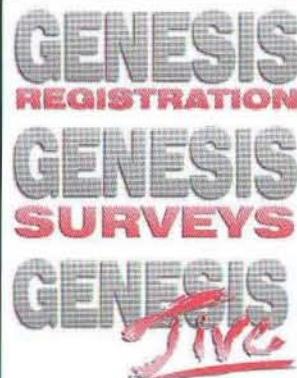
### Multi-threading

Beyond straight script execution, another factor can significantly affect the speed at which a given script runs: multi-threading. In the exponentially-growing world of the internet, it is common for the average web server to receive thousands of requests a day. It is also quite likely that two clients will request the exact same file at the exact same time. If the requested file happens to be your CGI script, it will have to deal with two concurrent requests.

AppleScript is not multi-threaded, and handles multiple concurrent requests by placing them into a queue. Unfortunately, AppleScript processes events on a last-in first-out basis – so the latest event received is the first to be processed. To put it another way, on a very busy server, the first person to call the CGI may very well be the last person to receive the results. This can result in every single request timing out if new requests keep forcing older ones further back in the queue.

Frontier is fully multi-threaded. Every new request spawns

Your web site better than the other 100,000 ?  
IT CAN BE WITH THESE NEW TOOLS !



Add exciting interactivity to your Mac web site with registration, surveys and real-time chatting!

ORDER  
ONLINE  
NOW!



Call Now! 607.255.2067  
email: product-info@webgenesis.com

Check them out at our entertainment site: THE GLOBE



<http://www.webgenesis.com>

a new thread automatically. This means that incoming events are processed immediately and do not prevent processing of earlier requests.

A more subtle, but still important performance consideration is the fact that all Frontier-based CGI's are hosted by a single application. In the cooperative multi-tasking Mac OS, applications must cooperatively share processing time. Adding a new, separate application for each CGI creates more overhead to manage the sharing of processor time among the competing applications and eventually slows down all the applications. Consolidating all CGI scripts into Frontier's object database eliminates this overhead.

### CONCLUSION

Being PowerPC-native and multi-threaded clearly gives Frontier the performance advantage over AppleScript. However, even if AppleScript were multi-threaded and native, its reliance on Scripting Additions and external applications to perform its functions severely limit performance, and thus limit its usefulness as a development environment for CGI applications.

### URL's

Native Frontier Public Beta release: [http://www.hotwired.com/userland/yabba/dabba/nativefrontierpublicbeta\\_390.html](http://www.hotwired.com/userland/yabba/dabba/nativefrontierpublicbeta_390.html)  
Frontier CGI Scripting: <http://www.webedge.com/frontier/>  
Aretha Website: <http://www.hotwired.com/userland/aretha/>



Microsoft Corporation  
One Microsoft Way  
Redmond, WA 98052-6399

Tel 206 882 8080  
Telex 160520  
Fax 206 936 7329



Gentlepersons,

Thank you for the support that you have shown to cross-platform development in the last year.

It was a fun year for me, as Microsoft's evangelist to the Macintosh software development community. From the popular free seminars on "Windows 95 Programming for Mac Developers" at last January's MacWorld Expo, through MacHack, and on-line, I have enjoyed working with Mac developers in their explorations of Windows 95 and Windows NT.

During that time, cross-platform support from previously Mac-only software companies has increased dramatically, with new releases of Object Master and 4<sup>th</sup> Dimension for ACIUS, ClarisDraw and ClarisWorks from Claris, Ray Dream Designer from Ray Dream, KPT Convolver from HSC, MacFlow from Mainstay, SimTown from Maxis, Metrowerks' CodeWarrior 7 x86-targeting cross-compiler, Route 66 from Route 66, and many, many others. In case no one has said it yet: thanks! Your applications make Windows better, and I am grateful for your support.

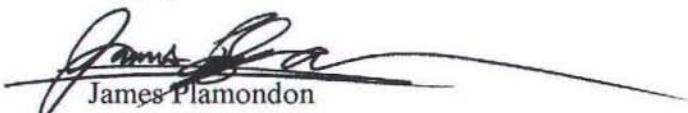
At the same time, Microsoft is helping previously Windows-only software developers move their applications to the Macintosh – and make cross-platform development easier for everyone – with our recently-released Visual C++ 4.0 Cross-Development Edition for the Macintosh and Power Macintosh.

This cross-platform support improves the experience of end-users, who can now use their favorite applications on the platform of their choice. Hopefully Microsoft, Apple, and our mutual third-party developers will continue to find new and innovative ways to work together to improve the end-user experience.

In all of this, I have enjoyed the friendship and camaraderie of a significant part of the Macintosh development community, and for that, especially, I thank you.

Looking forward to another great year of helping cross-platform developers, I remain

Yours,



James Plamondon  
Technical Evangelist  
Microsoft Developer Relations Group

P.S.: If you'd like to investigate supporting Windows in addition to the Mac, please check out Microsoft's Web site: <http://www.microsoft.com>.



By John R Powers, III, guideWorks, LLC

# New Apple Guide Authoring Aids

## ***Three books and accompanying software for Apple Guide authoring***

### *Apple Guide Complete: Designing and Developing Onscreen Assistance*

By Apple Computer, Inc.  
Addison-Wesley (0-201-48334-3)  
\$39.95. 554 pages.

### *Real World Apple Guide*

By Jesse Feiler  
M&T Books (1-55851-429-5)  
\$39.95. 411 pages.

### *Danny Goodman's Apple Guide Starter Kit*

By Danny Goodman and  
Jeremy Joan Hewes  
Addison-Wesley (0-201-48349-1)  
\$34.95. 295 pages.

Apple Guide authoring just got a lot easier. Three new books and accompanying software make it that way. If you already know about Apple Guide, skip to the next section. Otherwise, hang on and I'll give you a quick introduction. [For more on Apple Guide, see the March and July '95 *MacTech Magazine*.]

### **INTRODUCING APPLE GUIDE**

Apple Guide is the exciting help system that comes with System 7.5. It enables users to accomplish tasks with minimal directions. It actively leads users

through the steps required to complete desired tasks. For example, let's pretend you make fax software. You may use Apple Guide to lead your user through the steps to send a fax, including how to set up the address, cover page, and scheduling transmission. You do this by creating a guide file that interacts with the user step-by-step. The guide file checks the user's context and presents only the necessary information. It also automates many of the steps via AppleScript, and uses Apple Guide's unique "coach marks" to highlight live interface elements so that users can simply point-and-click their way through the process. Your users are happier and your customer support line is less busy.

With the recent release of version 2.0, Apple Guide technology is available from System 7.0 on up; and it will be a key part of Active Assistance in Copland. More and more applications are including guide files. Third party developers like the way it gives them a competitive advantage and reduces the load on customer support. Major corporate users like how it streamlines the work flow and how it reduces the load on the help desk.

### **AUTHORING APPLE GUIDE**

One authors Apple Guide by combining content and instructions into a guide file. The current guide authoring tools are *Guide Maker*, *Guide Composer*, and Danny Goodman's *Apple Guide Starter Kit*.

*Guide Maker* is the original Apple Guide authoring tool developed by Apple. It's five tools in one: build guide files, test look-for, diagnose guides, convert WinHelp, and import/export for localization. *Guide Maker* uses Guide Script as its means for "programming" guide files. Guide Script is a mark-up language; the author writes the guide content and tags the content with Guide Script. There are about 100 commands that control startup parameters, formats, sorting, sequences, and much more.

*Guide Composer* and Danny Goodman's *Apple Guide Starter Kit* (the latter included with his book, discussed in this article) are two new tools that provide a WYSIWYG interface to guide authoring. Both of them output Guide Script for automatic compilation by Guide Maker Lite, a special version of Guide Maker without a user interface.

Power Mac and  
Macintosh  
Developers:

## FIND OUT FAST WHAT'S GOING ON IN MEMORY

### THE MEMORY MINE™

- See memory allocation in any open heap at a glance.
- Easily spot memory leaks.
- Flags heap corruption when it happens.
- Works with source level debugger to let you find memory problems fast.
- Stress applications on the fly with Purge, Compact, and Zap.
- Allocate memory at will for precise stress testing.
- Log heap data - easily document heap status over time.
- No need for source code: nothing inserted in code; no patches to the system.
- Works with 24-bit, 32-bit, and modern memory managers.

For Macintoshes with 68020 or better. Requires System 7.0 or later.

only \$99 US

Order now from Adianta, Inc.

Phone: (415)781-8052 • FAX: (415)781-8053  
AppleLink:ADIANTA • AOL:Adianta • Internet:adianta@aol.com  
For VISA, MC, or American Express orders by mail, fax, or AppleLink, please include name, address, card number, expiration date, and phone number or email address.  
Also available through the MacTech Mail Order Store and APDA

for more information contact

 Adianta, Inc. • 582 Market St #911 • San Francisco, CA 94104

# Apple Guide

**Put the power of the leading  
on-screen help system to work for you**

We provide a full range of services to help you use this new technology most effectively.

- *Contract guide file development* -- give us your requirements and we will work with you to determine the best uses of Apple Guide in your application.
- *Development services* -- we can provide instructional design, content, scripting, and custom engineering to speed up your guide file development.
- *Technology transfer and training* -- we will help your staff develop Apple Guide expertise.

### Contact

Telephone: 408-395-1158  
Internet: powers@guideworks.com  
WWW: <http://www.guideworks.com>

**guideWorks**  
Intelligent Assistance Solutions

guideWorks, LLC 16378 Alexander Avenue Monte Sereno CA 95030

### NEW AUTHORING AIDS

The new books and accompanying software are:

#### *Apple Guide Complete: Designing and Developing Onscreen Assistance*

This is Apple's own Apple Guide book, written by Apple's Developer Press. Think of it as the Apple Guide *Inside Mac*, 2nd Edition, for guide authors. It provides authoring tips and suggestions, describes how to use Guide Maker and Guide Script, and documents the Apple Guide API.

*Apple Guide Complete* includes a CD-ROM with lots of Apple Guide material, including Apple Guide, Guide Maker, sample guide files, sample source files, sample context checks, the Apple Guide interface files and libraries, and a searchable command reference to all Guide Script commands. The CD-ROM does not contain the latest release of Apple Guide (2.0), Guide Maker (1.2.7), or Guide Maker Lite (1.2.5); those you'll have to get from Apple's ftp site, Apple's Developer CD, or the Mac OS SDK.

#### *Real World Apple Guide*

This book covers much of the same material as in *Apple Guide Complete*, but with an emphasis on actually using Apple Guide to solve problems. Think of it as Jesse's Handy Guide to Using Apple Guide. It contains the prerequisite chapters on Apple Guide, Guide Maker, Guide Script, and the API, but also includes chapters on creating guide files for use with common frameworks and applications. For example, it describes how to add Apple Guide to MacApp and 4th Dimension.

An accompanying CD-ROM includes Apple Guide, Guide Maker, and related files. It also includes lots of demos, and a cookbook which comprises shells, guide script examples, and code examples. Like *Apple Guide Complete*, the CD-ROM does not contain the latest releases.

#### *Danny Goodman's Apple Guide Starter Kit*

This book takes a completely different approach from the other two. Danny starts the reader immediately authoring guide files using his Starter Kit software. It's a very "hands on" approach that quickly produces a guide file from Danny's WYSIWYG interface. Once you learn how to use the authoring tool, Danny and his co-author, Jeremy Hewes, introduce design concepts and advanced topics.

The book includes a floppy disk with the Guide Starter software, Guide Maker Lite, a sample application, and support files. Apple Guide and Guide Maker are not included, nor are they necessary since Apple Guide is in System 7.5 and Guide Maker Lite is the only compiler Danny's software needs.

### COMPARISONS

We'll attempt to help you sort out the possibilities by providing a couple of different ways to compare the books.

## Who is the reader?

Third party developers use Apple Guide to create guides for their applications. All three books cover this.

Solution providers use Apple Guide to develop custom guides for end users. While ways to do this can be inferred from any of the three books, only *Real World Apple Guide* includes specific information on creating guides for common third party applications and frameworks.

Application software engineers need information on how to support Apple Guide within their applications. *Apple Guide Complete* and *Real World Apple Guide* provide API documentation for this.

## How well do they support the development process?

Creating Apple Guide files requires a seven-step process: task analysis, instructional and visual design, writing content, scripting, application integration, testing, and localization. Let's examine how each book supports each step in the development process.

- **Task analysis:** identifying and articulating the tasks that the user must accomplish. This is a very difficult step, but essential for Apple Guide's task-oriented design. Conclusion: zip for all three. None of the books provide help in this essential area.
- **Instructional and visual design:** specifying how the guide will support the user's tasks. Conclusion: all three books provide good coverage of this area. *Apple Guide Complete* provides the most information on design.
- **Writing content:** creating the words and images to support the instructional and visual design. Also includes all the indexing of the guide topics for the Apple Guide's search engine. Conclusion: *Apple Guide Complete* and Danny Goodman's book provide information on this area. *Apple Guide Complete* also covers the difficult area of indexing.
- **Scripting:** wrapping the Guide Script around the content. This includes all the sequencing of steps, context checking, and automation. Conclusion: All three books provide ample coverage of this difficult step in the process. None of the books cover automation scripting using AppleScript, though.
- **Application integration:** Apple Guide does not require that the application it supports be changed in any way, but if you can change it, you can really improve the user interaction. Application integration adds code to the application to support the guide. Conclusion: *Apple Guide Complete* and *Real World Apple Guide* provide reference material for application integration. *Real World Apple Guide* also provides detailed integration information for MacApp.
- **Testing:** guide files must be tested like any other complex software. Conclusion: *Apple Guide Complete* provides a little information.
- **Localization:** guide files, like the applications they support, must serve an international market. The guide content must be localized. Conclusion: *Apple Guide Complete* provides a little information.

# Superior Copy Protection

- \* **MAClock makes you money**
- \* **MAClock is SAFE, TRANSPARENT & EASY**
- \* **MAClock is aggressively priced**
- \* **MAClock works on Macs & Power PC's**
- \* **NETlock provides LAN license control**
- \* **Broad Product Range includes PARAllock (PC)**

Spending \$25+ for copy protection should get you more than a pretty dongle. Please let us explain why MAClock's micro processor is superior to old fashioned ASIC technology. Call us TODAY and order your Developer API. We will also send a kit to get you started on filing your copyright application.

EAGLE DATA  
PROTECTION

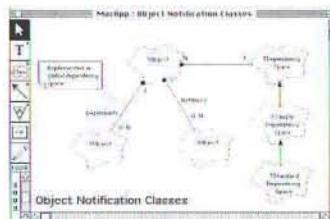
800-909-3141

On CompuServe GO PIRACY

350 S 400 East, Ste 101 • Salt Lake City, Utah 84111 • Tel 801-363-7300 Fax +801-538-0200

Call TODAY & Receive a FREE Copyright Filing Kit

## MultiQuest S-CASE



The Clear Choice for  
Serious C++ Architects

Take control of your C++ development with S-CASE, a powerful design environment for today's demanding applications. Visualize system requirements using the Booch notation. Generate C++ code automatically from your design. Keep your models and code in perfect synchronization. Call for your free demo disk and find out why companies like Motorola, Siemens and Amoco rely on S-CASE.

### Key Features:

- Booch notation (1994)
- Real time rule checking
- Iterative C++ code generation
- Hierarchical project manager
- Multi-user
- Multi-platform
- Check in / check out
- Color support

### Benefits:

- Rapid prototyping
  - Cleaner architectures
  - Reusable designs
- Platforms:**
- Macintosh
  - Windows
  - Sun SPARC
  - HP 9000

New!  
Version 2.0

Phone (708) 397-9930

Fax (708) 397-9931

Email 72531.2510@compuserve.com

# Presenting the extra-strength text editor.



If you thought previous versions of QUED/M were powerful, wait until you program with QUED/M 2.7, loaded with these new pain-relieving features:

- ⇒ Integrated support for THINK Project Manager™ 6.0 & 7.0
- ⇒ THINK™ debugger support
- ⇒ CodeWarrior™ support (now it's easier than ever to program for the Power Macintosh®!)
- ⇒ MPW ToolServer™ support
- ⇒ PopUpFuncs™ support
- ⇒ Frontier™ Do Script support

**For quick relief, call  
800-309-0355 today.**

Of course, QUED/M 2.7 still has all the features that make it easier to use than any other text editor:

- ⇒ Macro Language lets you automate tedious tasks
- ⇒ Search and Replace through multiple unopened files and using GREP metacharacters
- ⇒ File comparisons using GNU Diff
- ⇒ Unlimited undos and redos
- ⇒ 10 Clipboards that can be edited, saved, and printed
- ⇒ Customizable menu keys
- ⇒ Text folding
- ⇒ Display text as ASCII codes
- ⇒ Plus many more features!

**Get even more relief: Try QUED/M 2.7 now for just \$69! You'll get a 30-day money back guarantee too! Call now to order. 800-309-0355.**

QUED/M is a trademark of Paragon Concepts, Inc. All other products are trademarks or registered trademarks of their respective holders.

107 S. Cedros Ave. • Solana Beach, CA 92075 • Tel (619) 481-1477 • Fax (619) 481-6154

**NSUS**  
Software Inc.

# OOFILE™

## PowerPlant

integrated closer than any other database

## AppMaker

complete database application generation

## HTML

report-writer built into database

### No Stream Methods

### No PreProcessor

### No Fuss

dent@highway1.com.au

CompuServe: 100033, 3241

<http://www.highway1.com.au/adsoftware/>

demo's on CodeWarrior & AppMaker CD's  
royalty-free, full source, priced from \$900 inc. c-tree

**the cross-platform OODBMS that speaks C++™**

### What do I buy?

All three books are helpful for guide authoring. If you have to pick just one, consider the following: For a comprehensive reference, pick *Apple Guide Complete*. For custom solutions and practical applications, pick *Real World Apple Guide*. For a fast start, pick *Danny Goodman's Apple Guide Starter Kit*.



To receive information  
on any products  
advertised in this issue,  
send your request  
via Internet:  
[productinfo@xplain.com](mailto:productinfo@xplain.com)



By Eric Soldan, Apple Developer Technical Support

# OpenDoc: Contain Yourself ...

## ***Updating applications to work with OpenDoc***

It's time to be an OpenDoc™ container application. It's not too soon, and it's not too late. So how do you decide if your application should be an OpenDoc container application or not? Here's an easy test:

- Will your application benefit from Internet access?

If the answer is yes, then being an OpenDoc container application is probably the right thing to do. By becoming an OpenDoc container application, you automatically get the benefits of everything that is OpenDoc, including CyberDog, which will provide component oriented Internet clients and other Internet services. Now is not the time to ignore the Internet bandwagon. It's worth jumping on. The only question remaining is how to jump. Do you learn Open Transport and MacTCP and recode your entire application to support the Internet? Or do you look for alternatives, like OpenDoc?

A logical question therefore would

be: "Is OpenDoc really the fastest way to add Internet to your application?" Adding Internet support with OpenDoc boils down to adding basic OpenDoc support; in this article we will evaluate the difficulty of adding OpenDoc to an existing application. Then you can decide.

### **THE CONTAINER APPLICATION LIBRARY: YOUR FRIEND.**

CALib, the Container Application Library, has been evolving for a while. It's looking really good right now. Joshua Susser, of OpenDoc engineering, and I have been adding CALib support to an application I originally developed in Developer Tech Support called DTS.Draw. I wrote DTS.Draw years ago, without ever considering the possibility of adding something like OpenDoc later. DTS.Draw's document model, while flexible, is a closed model, so adding OpenDoc support is therefore a very interesting test case for CALib.

It turns out that the amount of additional coding necessary is minimal. However, due to CALib's flexibility, there were many development issues that had to be discussed for quite a while. If these discussions were not held, the implementation would not have been as robust. I will present what we've learned from these discussions.

First, let's talk about DTS.Draw for a while. When adding OpenDoc, it's important to understand how the existing application works. Since you are probably not familiar with DTS.Draw, I'll give you a quick overview.

DTS.Draw is an AppsToGo framework based application. AppsToGo is an object-oriented C framework written by DTS. DTS.Draw is also all C code. DTS.Draw is a "standard" drawing application. It has a tool palette of a variety of drawing objects. It has a hierarchical document architecture which allows for grouping and ungrouping of draw objects. It supports infinite undo. It supports drag and drop.

**Eric Soldan** – Eric Soldan is a seven year veteran in Apple DTS and an Apple short-timer. Once this is done, he'll turn in his badge and start his new life as a developer person. Yep – he's doing the startup thing. (Yawn...) His new company is called 6prime. (You may have already seen him quoted on the 11/6 cover of MacWeek as president of 6prime. And no, he didn't get a mug for the info.) 6prime will specialize in OpenDoc development and Windows-to-Mac porting.

**ANNOUNCING**

## LS OBJECT PASCAL V1.0

**OPTIMIZING COMPILER FOR 68K AND POWERMAC**

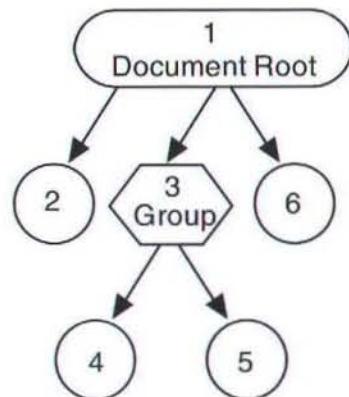
- COMPLETE PROGRAMMING ENVIRONMENT WITH OVER 100MB OF TOOLS AND DOCUMENTATION
- SOURCE LEVEL DEBUGGERS
- VISUAL INTERFACE GENERATOR
- SOURCE CODE GENERATOR
- PLUS**
- NATIVE PORTING KIT FOR MACAPP 2.0!
- COMING SOON! SUPPORT FOR SYMANTEC PROJECT MANAGER 8.0!

**CALL OR WRITE FOR MORE INFO:**

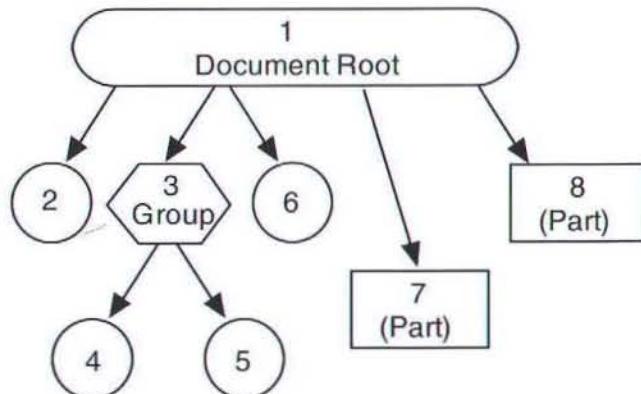
1-800-252-6479  
1-703-689-9593 fax  
Language Systems Corp.  
100 Carpenter Dr. Sterling VA 20164  
<http://www.langsys.com/langsys>

When a document is saved, the object hierarchy is flattened and streamed to the file. When a drag-out occurs, the selected objects are streamed into a handle; this stream represents a sub-hierarchy of the document. This sub-hierarchy is then just a flavor for the clippings file. When a file is opened (or a drag-in occurs), the hierarchy is reconstructed. Very standard stuff.

Here's a diagram of a representative DTS.Draw document:

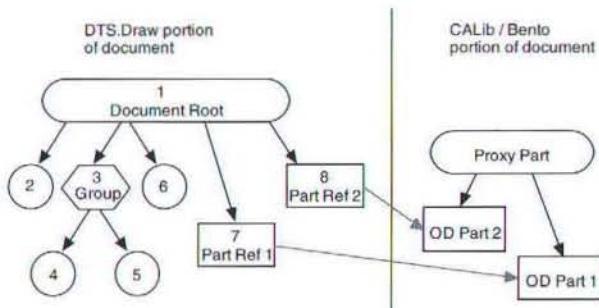


For a save, the objects in the hierarchy are streamed in simple tree-walk order, as indicated by the numbering. The drag objects 2, 4, 5, and 6 can be any supported object. The current implementation of DTS.Draw allows for line, rect, round rect, oval, and pie objects. More can be added of course, and this exactly is how we added OpenDoc support to DTS.Draw; we just added a new OpenDoc Part object into the application. The difference with this object is that the content isn't anything specifically manipulated by DTS.Draw. It is simply a part the user adds to the document. The DTS.Draw object just serves as a "container" for the OpenDoc part. If a user were to add two OpenDoc parts to the above DTS.Draw document, the document hierarchy might end up looking something like:



The implementation in DTS.Draw is relatively simple. The Part object inherits from DTS.Draw's native rect object. The difference is that it has a much more complex content that the rect object in the standard DTS.Draw application. The content of the Part object can be any OpenDoc part, of course. The

content of the Part object is managed using CALib. Given this information, look at this diagram and see exactly what the relationship between the Part objects and CALib:



As shown above, there's a lot more to the DTS.Draw document now. Fortunately, most of the new stuff is managed by CALib and OpenDoc. CALib uses a "proxy part" to contain the parts that are placed into the document content. Normally, OpenDoc expects there to be a root part that is an OpenDoc container, but since other parts are "embedded" into your application's non-OpenDoc document, a proxy container part is created and the "embedded" parts are stored in there. The proxy part, as far as OpenDoc is concerned, is what actually contains the other parts that are referenced from the DTS.Draw native content.

The difficulty here is that the proxy part isn't "real." It has no geometry information, and OpenDoc doesn't automatically bind the proxy part to any code, as is the normal case with OpenDoc parts. Thus, OpenDoc is unable to offer the full range of services for the embedded parts. But this is okay. The proxy part isn't all that smart, nor should it be. It is simply a part that is used by CALib to have somewhere to put the other parts.

So it's up to DTS.Draw to control the layout and presentation for the OpenDoc parts. Only the application knows the geometry information for the embedded parts, which is stored in DTS.Draw Part objects. The DTS.Draw Part object also has a persistent reference to the corresponding object embedded in the proxy part. Fortunately, CALib offers API calls to help manage these and other OpenDoc interactions, so the above and other OpenDoc related tasks are relatively simple to implement.

For example, to perform screen updates and such, DTS.Draw simply tells CALib to tell the part to draw itself. All that is needed is the Part Ref value, which indicates to CALib which embedded part to draw. The application doesn't have to care what it references. It references something, and that thing knows how to draw itself.

### STREAMING YOUR OBJECTS

Given that the proxy part can't really deal with containing parts by itself, (i.e., without your application doing the geometry), the proxy part and its embedded parts do not constitute a valid OpenDoc document. This is important when we decide what type of document you want to create when you save it to disk.

The choices are:



# GET AHEAD

Features
Help
Screen Blitting
A4/A5/PPC
Think/C++

**Automatic Radio Button Groups ▾**

- Tabs - Switch panels with tab sheet
- List - Switch panels with custom icons
- Popup - Switch panels with a popup
- Radio Buttons - Switch panels with buttons

**Complete User-Definability**

- Custom Default Buttons
- Custom Item Callbacks
- Cursor-Sensitive Help
- Mouse-Sensitive Cursor
- Custom Window Font
- Password Edit Fields

This context-sensitive help field was filled when the mouse passed over the Multi Panel menu.

The scroll bars on this text edit field become active when the data reaches the bottom of the bounding rectangle.

FGM Inc. • 703.478.9881 • <http://www.fgm.com> • email: opndlg42@fgm.com

1. A Bento stream placed inside your document.
2. Your document stream placed inside a Bento document.

The right choice will of course depend on your application. For DTS.Draw, we chose 1. Choice 1 is closer to existing Macintosh applications. Choice 2 is closer to regular OpenDoc parts. If you were to consider the development choices, from application to OpenDoc part, with CALib applications somewhere in between, your choices look something like this:

Application:

Standard document architecture.

CALib-friendly application:

Standard document architecture with embedded Bento stream.

CALib-savvy application:

Bento document with application data streamed into an OpenDoc storage unit value.

OpenDoc part editor:

Bento document with part editor data residing in an OpenDoc storage unit.

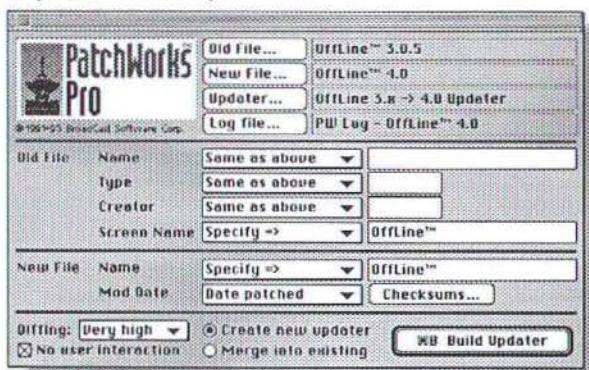
**BUILD UPDATERs  
WITHOUT PROGRAMMING!**

# PatchWorks™ Pro

PatchWorks Pro has many options, but only one function: to create small, stand-alone Updater Applications which field-upgrade your products to newer versions. Updaters can be freely and safely distributed online, since they are only of use to end-users who've already purchased your software.

## UPDATERs ARE FAST, SAFE & EASY FOR END-USERS

Your end-user just downloads and runs the Updater. The Updater prompts the user for the original software via a "Get File" dialog box (if not in the same folder as the Updater). When the user clicks the "Update" button, the original software is updated immediately.



## UPDATERs ARE CREATED IN MINUTES!

Why tie-up valuable programming time building updater applications? Just fill in a dialog, and PatchWorks does the rest! Since there's no coding or scripting, no bugs are introduced.

- Works with apps, INITs, cdevs, fonts, drivers, etc.
- Works on resource and/or data forks
- Full support for PowerPC and fat binaries
- Updaters support multiple "old versions"
- Preserves personalization data (name, serial #, etc.)
- Customizable end-user interface
- Updaters can execute custom CODE resources
- Intelligent diff-ing produces small Updaters
- Distribution of Updaters is unrestricted and royalty-free!

## NOW AN INDUSTRY STANDARD AFTER FOUR YEARS ON THE MARKET

PatchWorks Pro is used by Macintosh publishers such as: Apple Computer, Adobe Systems, MacroMind, Now Software, Symantec, WordPerfect, and many more. Pricing begins at \$195. Download a fully-functional trial version from our web site: <http://www.broadcastsoft.com>, or call us at (407) 241-0308.

# BroadCast

**BroadCast Software Corp**  
East: 407-241-0308, Fax: 407-241-3195  
West: 503-317-0429, Fax: 503-317-0430  
Net: <http://www.broadcastsoft.com>  
Email: [info@broadcastsoft.com](mailto:info@broadcastsoft.com)

When considering drag and drop, the above categories are very important. When applications drag something to the desktop, a clippings file is created. When OpenDoc parts are dragged to the desktop, an OpenDoc document is created, instead of a clippings file. This is an important distinction between applications and OpenDoc. Applications create clippings files because they are a standard and flexible intermediate format. OpenDoc parts create OpenDoc documents on a drag-out because an OpenDoc document is already a universal format. There's no reason to resort to creating a clippings file.

If you are a CALib application, the choice is no longer so clear. Our suggestion is to base your drag-out decision on whether your document format is still "native," or if you use a Bento file with your native content embedded.

So, if you are a CALib application, what is one to do on a drag-out? The answer lies in the document type. If the document type is an OpenDoc document (CALib-savvy), then the drag-out type is OpenDoc document. If the document type is a standard document (CALib-friendly), then the drag-out type is a clippings file.

DTS.Draw's native content is simply streamed out. After adding CALib support, this is still the case. The Bento document is streamed out, as well. Here's the new document format:

### Byte offset

0 to 3:

4 to nativeContent - 1:

nativeContent to EOF:

### Description

length of Bento stream

Bento stream

native content stream, i.e.,  
DTS.Draw old format

There was much discussion as to whether or not the Bento stream should be at the front of the file or the end. It turns out that you can do some interesting things if it is at the front of the file. Try out this situation:

1. Your machine has CALib. You add some OpenDoc parts to your DTS.Draw document.
2. You then send the document to some poor individual who doesn't have CALib or OpenDoc.

Guess what? If the Bento stream is in the front of the file, the unfortunate individual can still use the file with your CALib-friendly application. The user without CALib can actually edit the native content and save it out. The native content changes size, but hey, it's on the end of the file.

On machines that don't have CALib but need to display Part objects in their content, the standard look for "NoPart" should be used. This is what OpenDoc displays when an editor for a particular part isn't available. In the case of CALib applications, it works for when CALib isn't available, as well.

Making your CALib-based documents work on machines with or without CALib takes a bit of extra coding, but from a version control standpoint, it is well worth it. Documents can

go anywhere. A CALib document can be given to someone without CALib. That this person can actually edit the native content of the document, and then give the document back to you, is pretty nifty.

On machines where CALib isn't available, users obviously won't be able to add any new parts to the document. They will be restricted to editing the native content. However, this may include moving part objects around that someone else was nice enough to put in the document. This works. Remember that the geometry information is stored in the native objects, which all users can edit. The proxy part doesn't handle the geometry. In addition, the user can delete the Part objects (which are displayed using the "No Part" look). This of course means that there is data orphaned in the Bento stream. (Since the user doesn't have CALib, there is no way their machine can modify the Bento stream.) Fortunately, the stream will be compacted the next time the document is saved on a machine with CALib.

With some extra work, you can even allow the user to resize the Part objects without CALib. When this occurs, the information in the Bento stream for that part is no longer up to date. The native content object will need to be flagged as having been resized. When the document is opened on a machine with CALib, these objects will need to have their frame information renegotiated and resolved to reflect their new size.

We've been discussing types of editing that can still occur to a CALib document Part object when CALib isn't available. There are, of course, edits that can't be performed. Here are two:

1. Dragging that includes a Part object. Streaming the drag data must include streaming the Bento information into the flavor. This can't be done without CALib. All that's in the native object is a persistent reference to somewhere inside the Bento stream. You can't resolve the reference without CALib.
2. Copying the object. At first, it would seem that you would just copy the native content object. It has a persistent reference. Both copies of the object would then point to the same Bento information, i.e., the part. This is a bad thing. When opened again on a CALib machine, each copy of the part should be independent of the other. (You could flag the copy as an unresolved copy, and then clone the object when the document is next opened on a CALib machine.)

As you can see from this discussion, CALib can be used to add OpenDoc capability to your existing applications without radically changing the way they work. The actual amount of code added to an application isn't all that bad, either. Of course, this will vary, depending on architecture and document content, but most likely, it's not a complete recode with major modifications throughout your application. Look for the latest CALib and CASample sample code on the OpenDoc DR4 release.

Have fun out there!



## SOLID SOLUTION FOR ELECTRONIC DISTRIBUTION

# BroadCast™

BroadCast is a highly secure, patent-pending system for safely distributing "locked" software online, or on CD-ROM. This cutting-edge technology was developed by the same engineering team behind PatchWorks—our tool for creating online updaters that's become an industry standard used by clients like Apple Computer, Adobe Systems, MacroMind, Now

Software,  
Symantec,  
and  
WordPerfect.



**Unlock "CoolApp" for just \$40**

**CoolApp-electronic**

Please read this entire message before proceeding...

This program will unlock a full-blown version of CoolApp-in-finn CoolApp Software. Include em!

The CoolApp program:  
 The CoolApp program  
 CoolApp manual  
 CoolApp example files  
 CoolApp libraries

After unlocking CoolApp,  
[Open the CoolApp program](#)

**Order "CoolApp" for just \$40**

**Instructions:** Please complete the order form below, and we'll send you back a password that allows you to unlock your CoolApp.

Your Name:	First and Last
Company:	My Company
Address:	1234 Any Street Suite 123
City, State, ZIP:	Any Town, ST 12345
E-mail address:	myemail@mydomain.com
Daytime Phone:	(123) 456-7890 x1234
Fax:	(123) 456-7891
Visa Card	1234 5678 9012 3456
Expires:	01/99
It will be encrypted for your security. If you're not sure, click here.	
<a href="#">Cancel</a> <a href="#">E-mail order...</a> <a href="#">Fax order...</a>	

## BROADCAST IS EASY FOR YOU AND YOUR CUSTOMERS

In seconds, BroadCast securely locks your product into an Unlocker application that can be safely distributed to the public. To buy your product, customers simply run the Unlocker—then either call you, or complete an onscreen order form that's emailed or faxed to you with a unique "control number" (and encrypted credit card data).

Your staff processes the credit card, registers your new user, and provides your customer with a password based upon the control number. To unlock your software, the customer enters this password in the Unlocker.

## BROADCAST IS INEXPENSIVE

We aren't resellers or distributors. Customers buy directly from you, and we take no percentage of your sales—just a small fee per transaction. In fact, BroadCast is distributed for free. We're betting you'll quickly use the free password points that come with BroadCast, and purchase more as your sales soar.

We'll even help attract customers by advertising your products for free on our "Software Unboxed" internet mall.

## GET THE WHOLE STORY

We invite you to learn more by visiting our internet web site at "<http://www.broadcastsoft.com>", and download your free BroadCast Starter Kit, or email us: "[info@broadcastsoft.com](mailto:info@broadcastsoft.com)".

# BroadCast

**BroadCast Software Corp**

East: 407-241-0308, Fax: 407-241-3195  
West: 503-317-0429, Fax: 503-317-0430  
Net: <http://www.broadcastsoft.com>  
Email: [info@broadcastsoft.com](mailto:info@broadcastsoft.com)

**Simply the best GUI Building/Event Managing libraries**

Water's Edge Software  
2441 Lakeshore Road West • Box 70022  
Oakville, Ontario • Canada L6J 6M9  
Phone: (416) 219-5628  
Fax: (905) 847-1638  
Internet: WatersEdge@eWorld.com  
eWorld: WatersEdge  
CIS: 73424.2507

Tools Plus for  
Symantec (THINK) C/C++ \$149  
THINK Pascal \$149  
Symantec C/C++ & Pascal \$199  
CodeWarrior Bronze \$199  
CodeWarrior Gold \$249  
(We accept VISA and American Express. Add \$10 for shipping.)  
\* Call for Academic pricing

# Tools Plus™ 2.6

Tools Plus gives you the routines you need to create a professional looking user interface. Then we make it work. It's that simple.

**Now for  
CodeWarrior!**

- ✓ CodeWarrior ✓ C/C++ ✓ PowerPC  
✓ Symantec ✓ Pascal ✓ 680x0

- Over 170 high-powered "set and forget" routines that automate and enhance: event handling, windows, the tool bar, floating palettes, cursors, buttons, picture buttons, scroll bars, menus (pull-down, hierarchical and pop-up), list boxes, fields, Edit menu, clipboard, Dynamic Alerts, and more...
- Easy to learn and easy to use
- Substantial code reduction
- Dramatic code simplification
- Significantly less debugging
- System 6 and 7 compatible
- For novice, intermediate and advanced programmers
- Runs fast; needs little memory or disk space
- Safer than toolbox routines
- No royalties

OK

Language

- C/C++  
 Pascal  
 Both

Size:  
9  
10  
11  
12  
14  
18  
24  
36

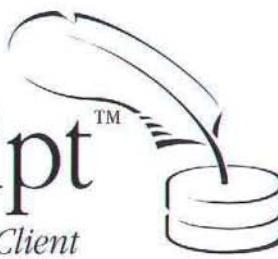
- Saves Time  
 Saves Money  
 Easy to Use



Free Evaluation Kit:  
Available on AOL, AppleLink,  
CompuServe, eWorld and other BBSs.  
Disk also available by mail.

# DataScript™

*The Scriptable Database Client*



DataScript is probably the **quickest**,  
**easiest** and most **cost-effective** way  
to make your integrated AppleScript  
solutions database aware - today.

**quickest.** You can make new or existing scripted solutions database aware in a flash. It takes just six lines of AppleScript to fetch data from an industry standard database management system such as Oracle, Sybase, DB2 or Informix. We think you'll be pleased with its performance too - it launches in an instant and is available accelerated for PowerPC.

**easiest.** DataScript's scripting vocabulary or terminology is easy to learn, easy to use and easy to remember. If you've done any scripting before then you'll be running with DataScript in no time. If you're new to AppleScript don't worry - "Inside DataScript" contains lots of easy to follow script snippets which you can reuse in your own solutions.

**cost-effective.** Because DataScript is so easy to learn and easy to use you'll become productive very, very quickly. Once you're ready to ship your finished database aware solution you'll find our licensing schemes very attractive.

DataScript can be purchased from General Knowledge by phone, Telephone +44 1202 746 026  
fax or INTERNET using VISA/Mastercard or American Express. Fax +44 1202 715 600  
DataScript is also available from the MacTech Mail Order Service INTERNET knowledgable@applelink.apple.com

By Bob Boonstra, Westford, Massachusetts



### SLIDING TILES

You have all probably seen small versions of the puzzle that is the basis for this month's Challenge: a 4-by-4 grid of interlocking tiles, with one empty tile among the 16 cells allowing the puzzle to be scrambled by sliding adjacent cells into the empty location. This month the Challenge is to write code that will unscramble a larger version of the Sliding Tiles puzzle.

The prototype for the code you should write is:

```
typedef Boolean /*legalMove*/ (*MoveProc) (
    /*Callback procedure to move tile at */
    long tileToMoveRow, /* these coordinates into the location */
    long tileToMoveCol /* of adjacent empty tile */
);

void SolveTiles(
    long *tiles, /* pointer to array of tiles where */
    long numRows, /* tile (row,col) is at */
    long numCols, /* (tiles + row*numCols + col) */
    MoveProc MakeMove /* Callback procedure to move a tile */
);
```

You will be given a pointer *tiles* into an array of tile values, the number of rows and columns in the puzzle (*numRows* and *numCols*, respectively), and the address of a callback procedure *MakeMove* used to tell my test code about the moves you make to solve the puzzle. The *tiles* array will be initialized with the values 0..*numRows*\**numCols*-1, in an order scrambled by the calling routine. The value 0 represents the empty tile.

Your code should make a sequence of calls to *MakeMove* and return when the puzzle is solved. Each *MakeMove* call exchanges the empty tile with the indicated adjacent tile. The puzzle is solved when you have moved each tile into its proper location: moving the tile with value *i* into location

*tiles[i]* (i.e., *row*=*i*/*numCols* and *col*=*i*%*numCols*).

The callback routine will be something like the code provided below:

```
static long gNumRows,gNumCols; /* initialized by test code */
static long gEmptyRow,gEmptyCol; /* initialized by test code */
static long *gTiles; /* initialized by test code */

#define TileValue(tiles,row,col) *(tiles+(row)*gNumCols+(col))
#define OutOfRange(val,num) ((val)<0) || ((val)>=(num))

static Boolean MakeMove(long tileToMoveRow,long tileToMoveCol)
{
    long diff;
    if (OutOfRange(tileToMoveRow,gNumRows)) return false;
    if (OutOfRange(tileToMoveCol,gNumCols)) return false;
    if (tileToMoveRow == gEmptyRow) {
        diff = tileToMoveCol - gEmptyCol;
    } else if (tileToMoveCol == gEmptyCol) {
        diff = tileToMoveRow - gEmptyRow;
    } else {
        return false;
    }
    if ((diff != -1) && (diff != 1)) return false;
    TileValue(gTiles,gEmptyRow,gEmptyCol) =
        TileValue(gTiles,tileToMoveRow,tileToMoveCol);
    gEmptyRow = tileToMoveRow;
    gEmptyCol = tileToMoveCol;
    TileValue(gTiles,gEmptyRow,gEmptyCol) = 0;
}
```

As an example, given the initial conditions:

```
long tiles[] = {1,4,0,3,5,2};
SolveTiles(tiles,2,3,MakeMove);
```

... you could generate the following moves:

```
MakeMove(1,2);
MakeMove(1,1);
MakeMove(0,1);
MakeMove(0,0);
```

Here's how it works: Each month we present a new programming challenge. First, write some code that solves the challenge. Second, optimize your code (a lot). Then, submit your solution to MacTech magazine. We choose a winner based on code correctness, speed, size, and elegance (in that order of importance) as well as the submission date. In the event of multiple equally desirable solutions, we'll choose one winner (with honorable mention, but no prize, given to the runner up). The prize for each month's best solution is a \$100 credit in the MacTech Mail Order Store and a limited-edition, "The Winner! MacTech Programmers Challenge" T-shirt (not available in stores anywhere).

Unless stated otherwise in the problem statement, the following rules apply: All solutions must be in ANSI compatible C. Use only pure C code. We disqualify entries with any assembly in them (except for challenges specifically stating otherwise). You may call any Macintosh Toolbox routine (e.g., it doesn't matter if you use NewPtr instead of malloc). We test entries with compiler options set to disable FPU use (for 680x0 code) and to enable all available speed optimizations. The compiler to be used and the target instruction set (680x0 or PowerPC) will be

### THE RULES

stated in the problem. **Limit your code to 60 characters per line;** this helps with e-mail gateways and page layout.

We publish the solution and winners for each month's Programmer's Challenge two months later. All submissions must be **received by** the 10th day of the month printed on the front cover of this issue.

You can get a head start on the challenge by reading the online version. We post it to the online services at the same time that we post source code. We make every effort to have it online no later than when the magazines are mailed, but we're unable to guarantee that it will be online by any given date.

Mark solutions "Attn: Programmer's Challenge Solution" and send it by e-mail to one of the Programmer's Challenge addresses in the "How to Communicate With Us" section on page 2 of this issue. Include the solution, all related files, and your contact info.

MacTech Magazine reserves the right to publish any solution entered in the Programmer's Challenge. Authors grant MacTech Magazine the exclusive right to publish entries without limitation upon submission of each entry. Authors retain copyrights for the code.

# Need to add plotting capabilities to your program?

Save time and money with one of our three popular Superplot libraries



## Plotting/Graphics Libraries

From \$150 - \$250

498 E. Robin Road • Orem, UT 84057 • Voice (801) 225-4356 • Fax (801) 226-6276

<http://www.SuperSoft.com>

- Choose *SuperPlot*, *SuperPlot+*, or *SuperPlotPRO*
- PowerMac version available
- Works with Fortran, C or Pascal
- Data analysis
- Batch processing
- 19 plot types
- Windows 95/NT version available for 2D and 3D
- New - Works with *CodeWarrior*!

For free demo and info contact **SuperSoft**



... to transform the puzzle like this:

1 4 0	→	1 4 2	→	1 4 2	→	1 0 2	→	0 1 2
3 5 2		3 5 0		3 0 5		3 4 5		3 4 5

It turns out that half of the possible permutations of the values  $0..(\text{numRows} * \text{numCols} - 1)$  are "illegal" in that they cannot be reached from the "solved" state. The calling routine will provide a legal starting state – you don't have to worry about the puzzle being unsolvable.

The number of moves you make to solve the puzzle is not an explicit criterion in determining the winner, but the winner will be determined by total execution time, including the time used by the callback routine, as we did in the Master MindReader challenge a few months back. Note that you are not permitted to optimize the callback routine – its purpose is to provide a fixed time penalty for each move your solution routine makes.

This will be a native PowerPC Challenge, scored using the Symantec 8.0.3 compiler. Good luck. Email me with any questions, or – better yet – join the Programmer's Challenge Mailing List ...

### MAILING LIST REMINDER

Many Challenge readers have already joined the Programmer's Challenge Mailing List announced last month. The list is being used to distribute the latest Challenge, provide answers to questions about the current Challenge, and discuss suggestions for future Challenges. The Challenge problem is posted to the list sometime between the 20th and the 25th of the month.

To subscribe to the list, send a message to

[autoshare@mactech.com](mailto:autoshare@mactech.com) with the SUBJECT line "sub challenge YourName", substituting your real name for YourName. To unsubscribe from the list, send a message to [autoshare@mactech.com](mailto:autoshare@mactech.com) with the SUBJECT line "unsub challenge".

### TWO MONTHS AGO WINNER

Congratulations to Eric Lengyel (Blacksburg, VA) for submitting the fastest entry to the EnclosingBounds Challenge. The problem was to find the smallest rectangle enclosing all of the non-white pixels in a PixMap. Eight of the 13 entries submitted worked correctly, but Eric's solution was significantly faster than the others. This is Eric's second victory in three months, following his first-place finish in the September Reversible Scrambling Algorithm Challenge.

The winning solution uses a clever technique to minimize the number of comparisons required to find the enclosing rectangle. Rather than test each pixel to determine if it is non-white, Eric logically ORs the values for all pixels in a row (for the indexed color cases), taking advantage of the fact that white is always represented by a zero value. A single comparison then determines whether that row contains only white pixels. Working separately from the top and bottom of the selection rectangle identifies the top and bottom rows of the enclosing rectangle. A similar technique applied to columns finds the left and right boundaries of the rectangle. For the direct (32-bit) color case, the approach is similar, except that pixel values in a row or column are logically ANDed, taking advantage of the fact that white is represented by the value 0x00FFFFFF.

Here are the times and code sizes for each of the correct



hen it comes to text editing have you ever hoped for a little divine intervention? Well if it hasn't arrived yet you should be considering PAIGE.

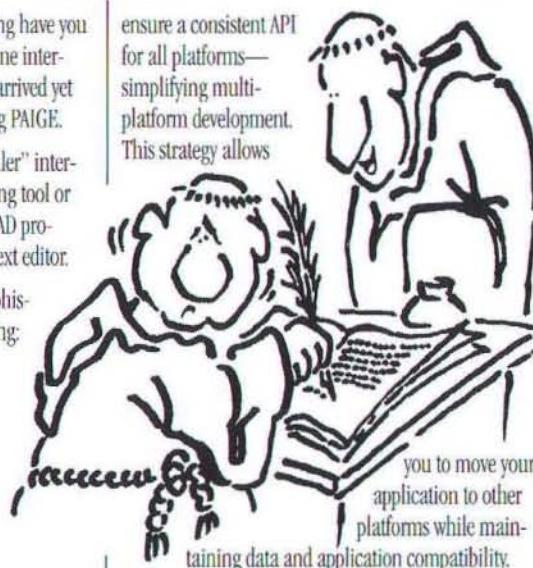
Whether you're developing the next "killer" internet application, building a custom publishing tool or adding advanced word processing to your CAD program, you can't ignore the quality of your text editor.

With PAIGE you can create the most sophisticated text features in the business. Including:

- Stylized Text
- Text Wrapping
- Embedded Objects
- Shapes & Containers
- Virtual Memory
- Style Sheet Support
- Multi-lingual Capable
- Portable C Code
- Royalty Free

PAIGE is written in portable C and uses no global variables. Machine specific code is minimized to

ensure a consistent API for all platforms—simplifying multi-platform development. This strategy allows



you to move your application to other platforms while maintaining data and application compatibility.

To simplify the integration of PAIGE into Windows (16-bit, 32-bit, '95 or NT) applications, our library ships as DLL's and can be used as a custom control. Combined with the message based demo source code

and simple introduction guide, PAIGE gets programmers up and running quickly.

So why should you buy PAIGE? TIME. Programmers can't afford to reinvent the wheel when implementing advanced text features within their applications.

Join the hundreds of major software publishers using PAIGE as their total text solution. For a complete technical and pricing summary, or to request our product demo, contact the DSI sales department today at 800-327-6703 or 360-573-9155.



### DataPak Software Inc.

9317 NE Hwy 99, #G • Vancouver, WA 98665-8900  
Bus: (360) 573-9155 • Fax: (360) 573-9269

Internet: 76424.3027@compuserve.com  
www.teleport.com/~datapak/datapak.html  
AppleLink: D0142 • AOL: DATAPAK1  
• CS: 76424,3027

## "Say, nice job brother John. Now could you make it a three column format with digital memos embedded in the text stream?"

entries. Numbers in parentheses after a person's name indicate that person's cumulative point total for all previous Challenges, not including this one.

Name	time 1-bit	time 8-bit	time 32-bit	test time	code size	data size
Eric Lengyel (20)	13	66	272	340	1608	320
Ernst Munter (100)	22	96	326	427	2980	32
Miguel Cruz Picao	34	110	476	593	3328	44
John Sweeney	75	145	502	659	4416	624
Bill Karsh (78)	54	135	517	662	1600	8
Tom Saxton	146	170	560	758	1044	132
Chris Rudolph	514	289	973	1354	1420	8
P.L.	6197	4672	5384	11181	656	24

The times listed above were all achieved using the Metrowerks CodeWarrior 7 compiler. Running the winning entry with code generated by the Symantec and MrC compilers (with all speed optimizations enabled in each case) gave some interesting results, with the MrC code executing in 2/3 to 3/4 of the time required by the others:

Compiler (version)	time 1-bit	time 8-bit	time 32-bit
MrC / MPW (1.0f2)	10	52	183
Metrowerks C (1.3.2)	13	66	272
Symantec (8.0.3)	17	75	292

An investigation of the generated code provides some insight into these numbers. CodeWarrior generates the following code for one of the inner loops in the winning solution:

```

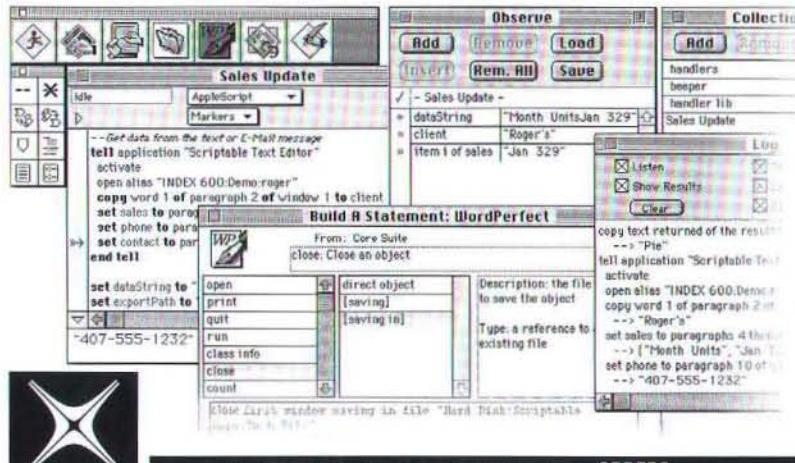
for (i = 0; i < numWholeWords; i++)
00000064: 7D274B78  mr      r7,r9
00000068: 38A00000  li      r5,0
0000006C: 48000014  b      *+20    : $00000080
{
    accumulator |= *(long *) k;
    k += 4;
}
00000070: 80070000  lzw      r0,0(r7)
00000074: 38A50001  addi   r5,r5,1
00000078: 7C630378  or      r3,r3,r0
0000007C: 38E70004  addi   r7,r7,4
00000080: 7C052000  cmpw   r5,r4
00000084: 4180FFEC  blt     *-20    : $00000070

```

# The #1 debugging and development environment for AppleScript™!

# Scripter®

- Real step-by-step debugging
- Variable watcher & expression evaluator: set variables, in context, during debugging!
- Enhanced trace log
- FaceSpan™ link
- Vocabulary access in a mouseclick
- Power-assisted statement construction
- Multifunction find & replace
- Automatic navigation to subroutines
- Background processing



If you're an AppleScript novice, Scripter will take you by the hand and show you the correct syntax for your statements. If you know what you're doing, Scripter will help you do it faster than any other editor. Scripter lets you debug properly: truly line-by-line, so you catch the offending code in the act. And only in Scripter can you then fix the problem, and continue debugging — right from where you left off. In fact, Scripter has so many exclusive features, we can't list them all here. So get a copy today, and start scripting with power!

## "Overall value ◆◆◆◆◆"

Scripter 1.0 is top AppleScript editor and debugger... If you expect to do anything more than idle fiddling with AppleScript, you need Scripter." — MacWeek, 6/12/95

By comparison, MrC generates the following longer, but faster code:

```

for (i = 0; i < numWholeWords; i++)
00F8 006C 48000018 b $+0x0018 ; 0x00000084
00FC 0070 X 4E800020 blr
0100 0074 31290001 addic r9,r9,1
0104 0078 7D4A3814 addc r10,r10,r7
0108 007C X 7C093000 cmpw r9,r6
010C 0080 X 4080FFF0 bge $-0x0010 ; 0x00000070
0110 0084 X 40990028 ble cr6,$+0x0028 ; 0x000000AC
0114 0088 X 7D0903A6 mtctr r8 ; CTR = 9
0118 008C X 2C080001 cmpwi r8,1
011C 0090 X 4181000C bgt $!0x000C ; 0x0000009C
0120 0094 X 38600001 li r3,1
0124 0098 X 7C6903A6 mtctr r3 ; CTR = 9
0128 009C X 318AFFFC subic r12,r10,4

    accumulator |= *(long *) k;
    k += 4;

012C 00A0 846C0004 lwzu r3,0x0004(r12)
0130 00A4 7C6B5B78 or r11,r3,r11
0134 00A8 X 4200FFF8 bdnz $-0x0008 ; 0x000000A0
  
```

Notice that the inner loop is 6 instructions in the CodeWarrior version but only 3 instructions in the MrC code. The key to the difference is the use of the mtctr, lwzu, and

bdnz instructions. The mtctr instruction loads the special purpose CTR register, which the bdnz instruction decrements and tests, branching when CTR is nonzero (similar to what the DBRA instruction does on 68K machines). The bdnz instruction replaces 3 instructions generated by CodeWarrior. The lwzu instruction loads a value from memory, but also stores the effective address back into the register used for the indirect memory access, replacing 2 CodeWarrior instructions. Reading disassembled compiler-optimized PowerPC code takes a little practice, but it can provide some insight into what the compiler is doing to you (or for you). Those interested in learning more are referred to the many PowerPC articles in past issues of MacTech, including a two part series by Bill Karsh in August and September of 1994.

## TOP CONTESTANTS OF ALL TIME

Here are the Top Contestants for the Programmer's Challenges to date, including everyone who has accumulated more than 20 points. The numbers below include points awarded for this month's entrants.

# GET YOUR NAME "IN LIGHTS"

Here at *MacTech Magazine*, we rely heavily on outside writers for most of the material that appears in our pages. If readers did not participate in the magazine, sending us their ideas and taking the time to write articles, there would be no *MacTech*. We like to think of *MacTech* as an ongoing dialogue amongst members of the Mac programming world: we facilitate the discussion, but it's the readers who carry it on, by responding to what they read and to their own programming experiences and interests, in writing. Sometimes we know that we need something specific covered, and we approach someone to write an article on that subject; and we do write a few columns in-house each month. But it is reader contributions, in the form of letters, tips, and especially articles, that give the magazine its relevance, its character, and its appeal.

So *MacTech Magazine* is not a staff of writers sending a constant stream of one-way messages outwards; it's a living, evolving network of readers conversing with one another, educating one another, sharing their knowledge, their experience, their interest, their trials and tribulations and joys and successes in the constantly unfolding story of programming the Macintosh. *MacTech Magazine* doesn't just happen: it's what the community makes it. If we carry reports of future trends and technologies, if we teach useful methods, if we review new books and tools, if we provoke thought, provide help, ride the wave of current interests and concerns, it is only because we reflect the thoughts of our readers, who speak through our pages.

You are invited to involve yourself in this exciting conversation amongst readers. You may be working at the cutting edge of programming technology, as part of a heavily funded professional

developer effort; you may be a lone hobbyist wrestling to create shareware for the sheer love of it. You may have been programming the Mac since its inception; you may have just switched over from Windows or Unix. You may work in C or C++ or Pascal or AppleScript, from scratch or in a framework. You may write big apps, small apps, custom solutions, extensions, code segments, for profit, for fun, for education, to solve one problem once. No matter who you are, no matter what your credentials may be, if you have a tale to tell, a trick to share, a technique to teach, we want you to consider joining the family of those who write for *MacTech*.

Don't just wait for a topic to be covered in *MacTech*! Don't just wish some technique would be explained better! Take responsibility! Write us an article yourself!

To write for *MacTech*, just send for our Writer's Kit. It's a Microsoft Word file containing the Styles you need to use, and giving lots of helpful advice and information, including all the legal stuff. You can let us know what you're writing about, if you want suggestions or feedback; this is helpful to us, because it lets us plan for the future. Or if you want to, you can just write the article and spring it on us when it's done. If we publish your article, you'll be paid for it!

Write to me, Matt Neuburg, at managing\_ed@mactech.com (or one of the other editorial addresses listed on page 2 of the magazine). Ask me for a Writer's Kit! Send me an article! Get published! Make money! See your name in print up there alongside the famous denizens of *MacTech*! And, most important, take the future of *MacTech Magazine* into your own hands!



Rank	Name	Points	Rank	Name	Points
1.	[Name deleted]	176	11.	Mallett, Jeff	44
2.	Munter, Ernst	110	12.	Kasparian, Raffi	42
3.	Gregg, Xan	81	13.	Vineyard, Jeremy	42
4.	Karsh, Bill	80	14.	Lengyel, Eric	40
5.	Larsson, Gustav	67	15.	Darrahan, Dave	31
6.	Stenger, Allen	65	16.	Landry, Larry	29
7.	Riha, Stepan	51	17.	Elwertowski, Tom	24
8.	Goebel, James	49	18.	Lee, Johnny	22
9.	Nepsund, Ronald	47	19.	Noll, Robert	22
10.	Cutts, Kevin	46			

There are three ways to earn points: (1) scoring in the top 5 of any Challenge, (2) being the first person to find a bug in a published winning solution or, (3) being the first person to suggest a Challenge that I use. The points you can win are:

1st place.....	20 points	5th place .....	2 points
2nd place.....	10 points	finding bug .....	2 points
3rd place.....	7 points	suggesting Challenge....	2 points
4th place.....	4 points		

Here is Eric's winning solution:

## ENCLOSINGBOUNDS

Copyright © 1995 Eric Lengyel

This algorithm is based on the following idea. Assuming that we are going to have to check many rows or columns which don't contain any non-white pixels, it is faster to combine all of the pixels in a row or column and look at the end result than it is to check each pixel individually. This is done by ORing entire rows or columns together for 1-bit and 8-bit deep pixel maps and ANDing entire rows or columns together for 32-bit deep pixel maps. The two different methods are necessary because for 1-bit and 8-bit pixel maps, white is represented by zeros and for 32-bit pixel maps, white is represented by ones.

The mask tables below are used with 1-bit and 8-bit deep pixel maps. They are needed when the left or right side of the selection rectangle is not word aligned.

\*/

```
long LeftMask1[32] =
{0xFFFFFFFF, 0x7FFFFFFF, 0x3FFFFFFF, 0x1FFFFFFF,
 0x0FFFFFFF, 0x07FFFFFF, 0x03FFFFFF, 0x01FFFFFF,
 0x00FFFFFF, 0x0007FFFF, 0x0003FFFF, 0x0001FFFF,
 0x0000FFFF, 0x000007FF, 0x000003FF, 0x000001FF,
 0x000000FF, 0x0000007E, 0x0000003F, 0x0000001F,
 0x0000000F, 0x00000007, 0x00000003, 0x00000001};
```

```
long RightMask1[32] =
{0x80000000, 0xC0000000, 0xE0000000, 0xF0000000,
 0xF8000000, 0xFC000000, 0xFE000000, 0xFF000000,
 0xFF800000, 0xFFC00000, 0xFFE00000, 0xFFFF0000,
 0xFFFF8000, 0xFFFFC000, 0xFFFFE000, 0xFFFFF000,
 0xFFFFF800, 0xFFFFFC00, 0xFFFFFE00, 0xFFFFFFF00,
 0xFFFFFFF80, 0xFFFFFFF0, 0xFFFFFFF0, 0xFFFFFFF0};
```

# Guide Composer

Previewed at WWDC '95

Develop Apple Guide files for any  
new or existing application

Available from the MacTech Mail Order Store

Demo Available:  
AppleLink, AOL, CIS,  
eWorld, Internet:Info-Mac



\$99

Guide Composer is a trademark of StepUp Software. Guide Maker is a trademark of Apple Computer, Inc.

- No Programming
- WYSIWYG Content Entry
- Coach Marks
- Index Terms
- PICTs
- Sounds
- Integrated with Guide Maker Lite (included) For Easy Compiles
- Optional Source Code Output
- Change back from your \$100

**STEPUP  
SOFTWARE**

7110 Glendora Avenue  
Dallas, Texas 75230  
214-360-9301  
214-360-0127 fax

```
0xFFFFFFFF8, 0xFFFFFFF8, 0xFFFFFFF8, 0xFFFFFFF8);  
  
long LeftMask8[4] =  
{0xFFFFFFFF, 0x00FFFFFF, 0x0000FFFF, 0x000000FF};  
  
long RightMask8[4] =  
{0xFF000000, 0xFFFF0000, 0xFFFFFFF0, 0xFFFFFFF0};  
  
long DirectWhite = 0x00FFFFFF; // Value of white pixel  
// in 32-bit map.  
  
void EnclosingBounds(PixMapHandle pm,  
Rect selection, Rect *enclosingRect)  
{  
    PixMapPtr map;  
    long pixelSize, rowBytes, accumulator,  
    leftMask, rightMask, baseAddr,  
    leftSide, rightSide, topSide, bottomSide,  
    numWholeWords, needLeftMask, needRightMask,  
    i, j, k, l, m;  
  
    map = *pm;  
  
    /* Compute position of selection rectangle relative to upper-left corner of pixel map. */  
  
    leftSide = selection.left - map->bounds.left;  
    rightSide = selection.right - map->bounds.left;  
    topSide = selection.top - map->bounds.top;  
    bottomSide = selection.bottom - map->bounds.top;  
  
    /* Check validity of selection rectangle. */  
  
    if ((rightSide <= leftSide) || (bottomSide <= topSide))  
    {  
        enclosingRect->left = enclosingRect->right =  
        enclosingRect->top = enclosingRect->bottom = 0;  
        return;  
    }  
  
    /* Determine characteristics of pixel map. */  
  
    rowBytes = map->rowBytes;  
    if (rowBytes >= 0) pixelSize = 1; // BitMap  
    else pixelSize = map->pixelSize; // PixelMap  
    rowBytes &= 0x3FFF; // Strip flags  
    baseAddr = (long) map->baseAddr;
```

EnclosingBounds

```
/* Handle 1-bit and 8-bit deep pixel maps with same chunk  
of code. 32-bit deep pixel map handled separately. */  
  
if (pixelSize != 32)  
{  
    /* Move baseAddr over to the first column of the selection rectangle, still keeping it  
word aligned. Then determine what masks are needed for leftmost and rightmost  
words in the selection and how many whole words there are in between. */  
  
    if (pixelSize == 1)  
    {  
        baseAddr += (leftSide >> 5) << 2;  
        leftMask = LeftMask1[(leftSide & 0x1F)];  
        rightMask = RightMask1[(rightSide + 1) & 0x1F];  
        numWholeWords = (rightSide >> 5) -  
            ((leftSide + 31) >> 5);  
    }  
    else  
    {  
        baseAddr += leftSide & 0xFFFC;  
        leftMask = LeftMask8[(leftSide & 3)];  
        rightMask = RightMask8[(rightSide + 1) & 3];  
        numWholeWords = (rightSide >> 2) -  
            ((leftSide + 3) >> 2);  
    }  
  
    /* Set flags indicating what masks are in use. If the left and right boundaries of the  
selection fall within the same word, then take the intersection of the left and right  
masks and only consider one column of words. */  
  
    needLeftMask = (leftMask + 1 != 0);  
    needRightMask = (rightMask + 1 != 0);  
    if (numWholeWords < 0)  
    {  
        leftMask &= rightMask;  
        needRightMask = 0;  
    }  
  
    /* Find first row with a non-white pixel by ORing the  
whole row together and checking for a non-zero result. */  
  
    j = topSide;  
    accumulator = 0;  
    m = baseAddr + j * rowBytes; // Top-left corner  
    do
```

# StoneTable

Break on through the limitations of the List Manager

	Name	Home Address
Father	<b>John Smith</b>	2138 NE Halsey Apt 3 Portland, OR 97232

Think C, CodeWarrior C, CodeWarrior Pascal, MPW C (68K or PPC)

Think Pascal, MPW Pascal, Prograph CPX (68K only)

68K StoneTable \$150 StoneTableExtra \$50 (per compiler)

PPC StoneTable \$100 StoneTableExtra \$25 (requires 68K)

International shipping (US Airmail) \$10

No royalty fees for applications

CodeWarrior C package includes PowerPlant Class

Demo - <ftp://ftp.teleport.com/pub/vendors/stack/StoneTableDemo.hqx>

**StoneTable**  
 Row and column titles  
 variable size row and columns  
 move, copy, sort, hide, resize rows and columns  
 edit cells in place  
 validate data entry through callbacks  
 set font, size, fore/back color, face, alignment per cell  
 cell margins, top/bottom & left/right  
 68K support for both A4 and A5 worlds  
 "LDEF-like" custom drawing function  
 greater than 32K data per table  
 plus all List Manager functions and more

StoneTable Publishing  
 P.O. Box 12665  
 Portland, OR 97212  
 voice/fax (503) 287-3424  
 stack@teleport.com

**StoneTableExtra**  
 drag cells in and between tables  
 PICT support  
 popup menus & check boxes  
 draw boxes around multiple cells  
 variable size grid lines  
 controls in cells

```

k = m;
if (needLeftMask)
{
    accumulator |= (*long *) k & leftMask;
    k += 4;
}
for (i = 0; i < numWholeWords; i++)
{
    accumulator |= *(long *) k;
    k += 4;
}
if (needRightMask)
{
    accumulator |= (*long *) k & rightMask;
}
if (accumulator != 0) break;
m += rowBytes;
} while (++j < bottomSide);
if (j == bottomSide) // Whole selection is white
{
    enclosingRect->left = enclosingRect->right =
        enclosingRect->top = enclosingRect->bottom = 0;
    return;
}
topSide = j;

/* Find last row with a non-white pixel. */

j = bottomSide - 1;
accumulator = 0;
m = baseAddr + j * rowBytes; // Bottom-left corner
do
{
    k = m;
    if (needLeftMask)
    {
        accumulator |= (*long *) k & leftMask;
        k += 4;
    }
    for (i = 0; i < numWholeWords; i++)
    {
        accumulator |= *(long *) k;
        k += 4;
    }
    if (needRightMask)
    {
        accumulator |= (*long *) k & rightMask;
        k += 4;
    }
} while (++j < bottomSide);
if (accumulator != 0) goto leftFound;
l += 4;
}

/* Find leftmost column containing a non-white pixel. */

accumulator = 0;
m = baseAddr + topSide * rowBytes;
l = 0;
if (needLeftMask)
{
    k = m;
    j = topSide;
    do
    {
        accumulator |= (*long *) k & leftMask;
        k += rowBytes;
    } while (++j < bottomSide);
    if (accumulator != 0) goto leftFound;
    l += 4;
}
for (i = 0; i < numWholeWords; i++)
{
    k = m + l;
    j = topSide;
    do
    {
        accumulator |= *(long *) k;
        k += rowBytes;
    } while (++j < bottomSide);
    if (accumulator != 0) goto leftFound;
    l += 4;
}
if (needRightMask)
{
    k = m + l;
    j = topSide;
    do
    {
        accumulator |= (*long *) k & rightMask;
        k += rowBytes;
    } while (++j < bottomSide);
}

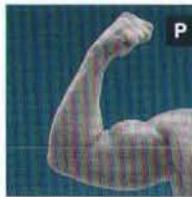
```

# It's Macintosh Accounting At Its Best



## FLEXIBLE

FlexWare is designed to give you almost unlimited possibilities as your company grows.



## POWERFUL

FlexWare's accounting features and reporting capabilities give you information you'll rely on daily to make smart decisions.



## FAST

Large businesses consistently choose FlexWare because of its exceptional speed on network and client/server systems.

Meet your clients' needs with the FlexWare Development System. FlexWare is an integrated, modular, *MacUser* Recommended award-winning accounting program that you can modify and customize to suit each of your clients' requirements. Take advantage of FlexWare's top performance and adaptability. It's flexible. It's powerful. It's fast. Call the FlexWare Sales Department at 800-447-5700 for information on the FlexWare Development System.

# FlexWare<sup>®</sup>

ACCOUNTING

**STATE OF THE ART**  
ACCOUNTING SOFTWARE

8211 Sierra College Blvd., Suite 440, Roseville, CA 95661-9406 • 916-791-7730 • FAX 916-791-5525 • 1-800-447-5700

/\* When we get to here, we have narrowed down the left-most non-white to the word. The value in the accumulator will tell us the exact column of the pixel. We then move baseAddr over to the last column of the selection rectangle (word aligned). \*/

```
leftFound:  
    if (pixelSize == 1)  
    {  
        leftSide = (leftSide & 0xFFFFFE0) + (1 << 3);  
        while (accumulator >= 0)  
        {  
            leftSide++;  
            accumulator <<= 1;  
        }  
        baseAddr = (long) map->baseAddr +  
            ((rightSide - 1) >> 5) << 2;  
    }  
    else  
    {  
        leftSide = (leftSide & 0xFFFFFFFF) + 1;  
        while ((accumulator & 0xFF000000) == 0)  
        {  
            leftSide++;  
            accumulator <<= 8;  
        }  
        baseAddr = (long) map->baseAddr +  
            ((rightSide - 1) & 0xFFFF);  
    }  
  
    /* Find rightmost column containing a non-white pixel. */  
  
    accumulator = 0;  
    m = baseAddr + topSide * rowBytes;  
    l = 0;  
    if (needRightMask)
```

```
    {  
        k = m;  
        j = topSide;  
        do  
        {  
            accumulator |= (*((long *) k) & rightMask);  
            k += rowBytes;  
        } while (++j < bottomSide);  
        if (accumulator != 0) goto rightFound;  
        l += 4;  
    }  
    for (i = 0; i < numWholeWords; i++)  
    {  
        k = m - l;  
        j = topSide;  
        do  
        {  
            accumulator |= (*((long *) k) & rightMask);  
            k += rowBytes;  
        } while (++j < bottomSide);  
        if (accumulator != 0) goto rightFound;  
        l += 4;  
    }  
    if (needLeftMask)  
    {  
        k = m - l;  
        j = topSide;  
        do  
        {  
            accumulator |= (*((long *) k) & leftMask);  
            k += rowBytes;  
        } while (++j < bottomSide);  
    }  
    rightFound:  
        if (pixelSize == 1)
```

# DragInstall 2.0

## Here's proof

### that the more things change

- ▲ New "Quick Build" option lets you build a complete installer in *one easy step*.
- ▲ New features such as locating files and folders, applying patches, and replacing outdated files allow you to build more intelligent installers.
- ▲ Improved support for installing non-archived files simplifies the creation of CD-ROM and network installers.
- ▲ PowerPC-native compression and decompression cuts installation time *in half*.
- ▲ AppleEvent and scripting support allows installations to be automated.

### the more they stay the same

- ▼ Same price — \$300 lets you distribute an *unlimited* number of installers for *all* of your products. No yearly fee, no royalties, no hidden costs.
- ▼ Same drag-and-drop interface familiar to all Macintosh users.
- ▼ Same reliability and robustness that developers have relied on since 1991.
- ▼ Same support policy — free technical support and low (or no) cost upgrades.

**For more information or a free demo call 1-800-890-9880**

**or visit our Web site at <http://www.sauers.com/draginstall>**

You've spent  
**enough**  
time in  
development.

Don't let your  
installer keep  
you from **going**  
**golden**.

- Destination**
- User Specified Folder
  - User Specified Disk
  - Startup Disk
  - Desktop
  - Active Apple Menu Items
  - Active Control Panels
  - Active Extensions
  - Active Fonts
  - Active Preferences
  - Active Startup Items
  - Active System Folder

- Condition**
- Versions ▶
  - Existing File ▶
  - System ▶
  - Display ▶
  - Processor ▶
  - Custom ▶
  - Gestalt... ▶
- |                       |
|-----------------------|
| Any Processor         |
| Any 680x0             |
| Any PowerPC           |
| 68000                 |
| 68020 or higher 680x0 |

- Options**
- Minimum System...
  - Startup Picture...
  - Startup Text...
  - Installation Dialog...
  - User Specified Folder...
  - Progress Cursor...
  - Warning Dialogs...

Just because your software is done doesn't mean your work is. You still have to write an installer. And that can add precious days or even weeks.

With Aladdin Systems' proven installation standard, StuffIt InstallerMaker™, you can have your PowerMac® or 680x0 product ready to ship literally within minutes, and save money to boot.

StuffIt InstallerMaker uses our advanced compression technology to reduce the number of disks needed to ship, which saves you money on every unit. Its menu-driven interface is so easy-to-use that even your VP of Sales could prepare your installer.

New version 2.0.2 adds full PowerMac support, improved scriptability, and expanded localization,

including German, French, and Japanese.

To receive a free, fully-working copy of StuffIt InstallerMaker, call our licensing department today at (408) 761-6200.

# STUFFIT INSTALLERMAKER

© 1994 Aladdin Systems, Inc. 165 Westridge Drive, Watsonville, CA 95076. Fax: (408) 761-6206. America Online, AppleLink: ALADIN. Internet: aladdin@well.com. InstallerMaker is a trademark of Aladdin Systems, Inc. All other products are trademarks of their respective holders.

```

rightSide = ((rightSide + 31) & 0xFFFFFFFF) - (1 << 3);
while ((accumulator & 1) == 0)
{
    rightSide--;
    accumulator >>= 1;
}
else
{
    rightSide = ((rightSide + 3) & 0xFFFFFFFFFC) - 1;
    while ((accumulator & 0x000000FF) == 0)
    {
        rightSide--;
        accumulator >>= 8;
    }
}

```

/\* Now for the code which handles 32-bit deep pixel maps. For direct pixels white is ones, unlike indexed pixels where white is zeros. We will use the same technique, but we will have to AND the rows and columns together. We don't have to worry about left and right masks - in 32-bit deep pixel maps every pixel is word aligned. \*/

```

else
{
    baseAddr += leftSide << 2;
    numWholeWords = rightSide - leftSide;
}

```

/\* Find first row. \*/

```

j = topSide;
accumulator = DirectWhite;
m = baseAddr + j * rowBytes;
do
{
    k = m;
    i = 0;
    do
    {
        accumulator &= *(long *) k;
        k += 4;
    } while (++i < numWholeWords);
    if (accumulator != DirectWhite) break;
    m += rowBytes;
} while (++j < bottomSide);
if (j == bottomSide) // All white pixels
{
    enclosingRect->left = enclosingRect->right =
        enclosingRect->top = enclosingRect->bottom = 0;
    return;
}
topSide = j;

```

/\* Find last row. \*/

```

j = bottomSide - 1;
accumulator = DirectWhite;
m = baseAddr + j * rowBytes;
do
{
    k = m;
    i = 0;
    do
    {
        accumulator &= *(long *) k;
        k += 4;
    } while (++i < numWholeWords);
    if (accumulator != DirectWhite) break;
    m -= rowBytes;
} while (--j >= topSide);
bottomSide = j + 1;

```

/\* Find leftmost column. \*/

```

accumulator = DirectWhite;
m = baseAddr + topSide * rowBytes;
l = 0;
i = 0;
do
{

```

```

k = m + 1;
j = topSide;
do
{
    accumulator &= *(long *) k;
    k += rowBytes;
} while (++j < bottomSide);
if (accumulator != DirectWhite) break;
l += 4;
} while (++i < numWholeWords);
leftSide += 1 >> 2;

/* Find rightmost column. */

baseAddr = (long) map->baseAddr +
    (rightSide << 2) - 4;
accumulator = DirectWhite;
m = baseAddr + topSide * rowBytes;
l = 0;
i = 0;
do
{
    k = m - 1;
    j = topSide;
    do
    {
        accumulator &= *(long *) k;
        k += rowBytes;
    } while (++j < bottomSide);
    if (accumulator != DirectWhite) break;
    l += 4;
} while (++i < numWholeWords);
rightSide -= 1 >> 2;
}

```

/\* Return enclosing rectangle in the pixel map's local coordinates. \*/

```

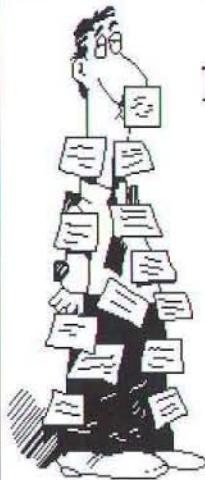
enclosingRect->left = leftSide + map->bounds.left;
enclosingRect->right = rightSide + map->bounds.left;
enclosingRect->top = topSide + map->bounds.top;
enclosingRect->bottom = bottomSide + map->bounds.top;

```



Visit MacTech Magazine's Web site!

<http://www.mactech.com>



**DON'T FORGET!**  
To receive information  
on any products  
advertised in this issue,  
send your request  
via Internet:  
[productinfo@xplain.com](mailto:productinfo@xplain.com)

## ALL BUGS ARE STUPID.

But spending tedious hours trying to track them down is dumber still. Why not let a tool do the work? QC can find many of those mistakes automatically. Ever write data beyond the end of a memory block? Ever rely on a handle that was purged? Ever call DisposeHandle on a resource or ReleaseResource on a handle? Sure you have! Maybe you just haven't found out about it yet... QC finds these errors and more.

### BECAUSE:

Every programmer makes mistakes.  
All programs ship with bugs.  
Marketing just cut the beta.  
You could use some sleep.

### YOU NEED:



QC is cool and, unlike other development tools, QC is easy. Try it **FREE**:

1. Connect to our web site
2. Download QC (less than 200K)
3. Send us email to get a serial #
4. Run the installer
5. Run your program
6. Press shift-option-q

"I only have 6 non-Apple Control Panels on my development machine. QC is one of them," Nuff said."

-Bill Goodman, Compact Pro author

"We wouldn't ship a product without QC's approval."

-Mike Gross, Claris Corporation

**NOW POWERPC NATIVE! EXISTING USERS UPGRADE FREE!**



**\$99**

Onyx Technology 7811 27th Ave Bradenton, FL 34209  
Tel: 941.795.7801 Fax: 941.795.5901  
Web: <http://www.std.com/onyxtech/>  
AOL: OnyxTech AppleLink: D2238 CIS: 70550.1377

# Mac Source Code CD-ROM Apprentice 4 is here!

"It's wonderful. It's saved me probably 20 hours of time in just the last week. It is well worth adding to your collection, definitely one of the most useful CDs in my collection."

- Peter Lewis

Over 650 megabytes of high-quality and up-to-date Mac-only source code from hundreds of programmers. If you're looking for great source code examples, this is the CD-ROM for you. All of the source code examples are new and updated in this release. Apprentice source is mostly C, C++, and Pascal, using CodeWarrior, Symantec, and MPW. Includes examples of applications, games, code resources, control panels, system extensions, plug-in modules, hundreds of snippets, and much more!

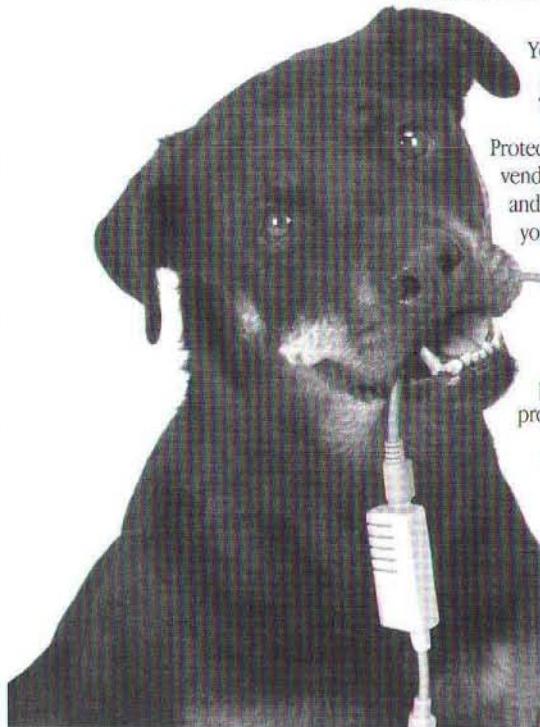
**\$35. Upgrade from any previous Apprentice release for only \$25!**

Shipping included for U.S. and Canadian orders. Add \$5 for shipping outside the U.S. and Canada. Visa, MasterCard, American Express, and Discover gladly accepted.

Celestin Company, Inc., 1152 Hastings Avenue, Port Townsend, WA 98368  
800 835 5514 • 360 385 3767 • 360 385 3586 fax  
Internet: [celestain@celestain.com](mailto:celestain@celestain.com) • <http://www.celestain.com/>

# TASTES LIKE CHICKEN!

*Without secure software, even the most expensive hardware key is nothing but a chew toy.*



You need to protect your software. Hardware vendors will try to convince you that hardware keys are the only secure method of protection. They're wrong.

Protection is only as effective as the software involved. Most hardware key vendors require that you, the developer, spend major resources protecting and obscuring the code which interacts with a key. Without this effort on your part, your software is vulnerable, even to inexperienced hackers.

At PACE, we understand that software is the most important component of a working protection system. For more than a decade we've developed low cost and secure software based protection schemes. Our MacEncrypt system will turnkey protect your application automatically, applying multiple layers of PACE proprietary encryption and self checking algorithms to your product.

MacEncrypt is a secure, flexible, compatible and low cost protection investment. No false promises, wasted development time, upset users or expensive chew toys.

Trust the protection of your software to the people who understand software. Call today to order your PACE Developers Kit.

PACE Anti-Piracy 1082 Glen Echo Ave., San Jose, CA 95125  
Vox: (408) 297-7444 • Fax: (408) 297-7441 • AppleLink: PACE.AP  
email: info@paceap.com • Web page: <http://paceap.com/pace.html>



**PACE**  
**ANTI-PIRACY**

*"Our Japanese font supplier imposed strict copy-protection obligation on Adobe Systems. Because of this we have been using PACE software protection on Adobe Type Manager Japanese version and our other Japanese font products for almost 5 years. PACE's software solution provides us with effective security at a low cost. Our working relations with PACE is excellent and their expert technical staff has always been helpful."*

Paul Anderson  
Senior Director, Pacific Rim  
Adobe Systems, Inc.

## World's Leading FORTRAN 77 for Macintosh

### 68K and Power Macintosh versions

- full ANSI 77 native compiler
- faster execution speed
- graphical source-level debugging
- two complete graphics packages
- make utility, MRWE application framework
- System 7.5 compatible, MPW included
- Windows 95/NT version also available



Visit us now at <http://www.absoft.com>

**absoft**  
development tools and languages

2781 Bond Street Rochester Hills MI 48309 • (810) 853-0050 • Fax (810) 853-0108 • sales@absoft.com



By Jim Straus, URLs@mactech.com

Spare your fingers and find the full list online at:  
<http://www.mactech.com/URLs.html>

Or 1(for a limited time), send mail to:  
[MacTech-URLs@class.com](mailto:MacTech-URLs@class.com) and you'll receive the latest list back.

### LATEST UPDATES

#### Internet Related

Consensus	<a href="http://www.consensus.com/">http://www.consensus.com/</a>
Excite Netsearch	<a href="http://www.excite.com/">http://www.excite.com/</a>
Jon Pugh	<a href="http://iw.cts.com/~jonpugh/software/Hypercard/URLs.sit.hqx">http://iw.cts.com/~jonpugh/software/Hypercard/URLs.sit.hqx</a>
TopSoft (Internet User's Group)	<a href="http://www.topsoft.org/">http://www.topsoft.org/</a>

#### Other Programmer Resources

Club Macintosh de Québec	<a href="http://www2.zone.ca/~cmq/">http://www2.zone.ca/~cmq/</a>
Everything Macintosh	<a href="http://www.cs.brandeis.edu/~xray/mac.html">http://www.cs.brandeis.edu/~xray/mac.html</a>
Robert Lentz	<a href="http://www.astro.nwu.edu/lentz/mac/">http://www.astro.nwu.edu/lentz/mac/</a>
Programmer's Challenge	<a href="http://www.mactech.com/mail-list.html#prog-challenge">http://www.mactech.com/mail-list.html#prog-challenge</a>

#### Vendors, Products and Miscellaneous

Cyclos	<a href="http://www.cyclos.com">http://www.cyclos.com</a>
Entertaining Macintosh	<a href="http://www.fen.bris.ac.uk/students/am4001/macgames/">http://www.fen.bris.ac.uk/students/am4001/macgames/</a>
see also	<a href="http://www.princeton.edu/~pjcreath/macgames/">http://www.princeton.edu/~pjcreath/macgames/</a>
JYACC	<a href="http://www.jyacc.com/">http://www.jyacc.com/</a>
MacVonk	<a href="http://www.ccnet.ab.ca/macvonk/">http://www.ccnet.ab.ca/macvonk/</a>
MacWay mailing list	<a href="mailto:listproc@abs.apple.com">mailto:listproc@abs.apple.com</a> In the body of the message put: subscribe MACWAY your name
MacWorld	<a href="http://www.macworld.com/">http://www.macworld.com/</a>
Play it again Mac	<a href="http://www.pht.com/macpages/name_me.html">http://www.pht.com/macpages/name_me.html</a>

### HIGHLIGHTS

#### Internet

Architect is a small company (started by six Stanford students) who have some interesting text indexing software. Their software tries to index based on concepts as well as keywords. To demonstrate their wares, they've taken to indexing the World Wide Web and making their database available. Check them out and try searching for some concepts.  
**Excite Netsearch** <http://www.excite.com/>

Jon Pugh has created a new bookmarking HyperCard stack. This free program can help you keep track of your URLs, especially if you end up with lots of them, as I do.

**Jon Pugh** <http://iw.cts.com/~jonpugh/software/Hypercard/URLs.sit.hqx>

#### Macintosh

For those of you who would like to read your Macintosh news in something besides English, I suggest the Club Macintosh de Québec. This site is a French-Canadian Macintosh users group, and they have nicely organized a lot of Macintosh information. A good source for those whose French is better than their English.

**Club Macintosh de Québec** <http://www2.zone.ca/~cmq/>

Here's another huge index of Macintosh resources. Nathan Raymond has put together quite an extensive list of information.  
**Everything Macintosh** <http://www.cs.brandeis.edu/~xray/mac.html>

We've all known that Robert Lentz has a great site for Mac developers, but recently I've been looking through some of his other pages. He's done an equally outstanding job with lots of information of interest to anybody with any interest in the Mac. It's time to check him out again.

**Robert Lentz** <http://www.astro.nwu.edu/lentz/mac/>

I've come across a couple of sites about gaming on the Macintosh. While we await the Pippin machine from Bandai Co. Ltd., you can see what's new in gaming on the Mac. There's lots of information on both shareware/freeware and commercial games.

**Entertaining Macintosh**

<http://www.fen.bris.ac.uk/students/am4001/macgames/>

see also <http://www.princeton.edu/~pjcreath/macgames/>

**Play it again Mac** [http://www.pht.com/macpages/name\\_me.html](http://www.pht.com/macpages/name_me.html)

Guy Kawasaki has another mailing list he's running. This one is more evangelism than Semper Fi, but if you're trying to sell to the Macintosh community, it would be a good resource to track.

**MacWay mailing list** <mailto:listproc@abs.apple.com>

In the body of the message put: subscribe MACWAY your name

Finally, if you're interesting in the monthly Programmer's Challenge, you can join our mailing list of discussion relating to the challenge. Our mailing list web page as a form to allow you to subscribe.

**Programmer's Challenge**

<http://www.mactech.com/mail-list.html#prog-challenge>

#### Neat non-Macintosh site of the Month

If you didn't know, people have been putting cameras around and posting the pictures on the Internet. Normally a camera is set up to take a new image periodically (every 5 minutes, for example) and the picture posted. Cameras have been set up overlooking a golf course in Hawaii, in an elementary school classroom, looking at a fish tank, and any number of people offices. For a fairly complete list, check out this page.

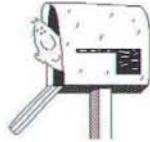
**Cameras, Cameras, and More Cameras**

<http://www.intertain.net/~cameras/>

Well, that's it for this month. As always, if you find something interesting, or have updates, send them to [URLs@MacTech.com](mailto:URLs@MacTech.com)

Thanks this month to Christopher Allen, Bill Goodman, Robert Lentz, Jon Pugh, Nathan Raymond, and many others for their contributions for their suggestions and pointers to new and old sites.

By Matt Neuburg, Managing Editor



### BRING BACK THE GOOD OLD DAYS

I am an entirely self-taught, by now intermediate level Mac programmer (unashamedly Pascal - CW, though I still utilize Think Pascal 4.0.2) who enjoys *MacTech* very much. I have been reviewing and learning a great deal from your back issues from the "distant" past! Nevertheless, I do have certain beefs. I am somewhat disturbed by the trend to feature to such a great extent the more technically advanced aspects of programming understood by the few, from which the rest of us can learn very little, I'm afraid. In the past there was a certain gleeful joy about programming, a certain spirit and amazement and perhaps naïveté about it all that seems to be missing now. The magazine seems too severely oriented to the well-equipped professional, with an insufficient amount of time devoted to us weekend, sparetime adventurers.

Additionally, far too much space is given over to Symantec and not enough to Metrowerks. And there is just too %^&\* much C++. As a "Pascallian", I read a lot of C and adapt it to my needs. C++ is impossible, and I find it very hard even to follow the basic ideas being presented. I know that you cannot force people to write articles in any one language (and I know that C++ and C for that matter aren't going to disappear), but it would be great if you encouraged authors whose articles are in C/C++ to make some effort to put the Pascal/OP counterpart in a parenthetical or a footnote. At least some effort ought to be made to explain the less obvious portions of the C/C++ program code by pointing out various things that Pascal programmers should be aware of and by offering possible Pascal/OP solutions where that is possible. After all, as was noted in the November issue somewhere, *MacTech* is the only programming magazine for the Mac! Efforts should be made to include more of us in the challenge that is Mac programming. I, for one, don't like feeling left out for no good reason. Thanks.

- Jeff Niederboffer

*Jeff, I sympathize strongly with your plea. At MacTech, we're looking to extend our scope to include once more those "weekend, sparetime adventurers" – without, of course, losing our edge as a forum for the professional developer community. Of course, sending us the articles is up to you, the readers! – Ed. manl*

*[As for your comments on Symantec vs. Metrowerks, please take note (in this issue) of the introduction of "From the Factory Floor" – our new column to give Metrowerks a presence in the magazine. You should expect to see this as a regular feature and you should take pride in knowing that you, the readers, made it happen. – Ed. nst]*

### APPLE MISSING ITS CHANCE TO REWRITE THE OS

Scott Boyd hit the nail on the head with his comments, in the November issue of *MacTech*, about overcoming limitations. Apple has made a tragic mistake in the way it is handling compatibility with Copland. The legacy code of Apple continues to grow, with all its limitations. It is very sad that developers are constantly faced with constraints that could have been built out of the system years ago.

Apple needs to look at the OS and see that when a machine has 8–16 meg as standard, 32K worth of text (or less if it's a big font) is ridiculously small. Apple has also recommended that we avoid creating too many resources (I can't recall the exact figure, but I believe it is in the 2K range). In Apple's words, "The Resource Manager is not a Database". My question is: Why not? Why can't we have a 10,000 entry file that contains 60K of text that can be written in a few lines of code? Why do we need to do linear searches to find a resource?

How could Apple have fixed these problems? One obvious way might be to create new Managers with new APIs. I'm sure developers would flock to such managers. While this would work, I think Apple could have done something more radical to rid itself of all this legacy code.

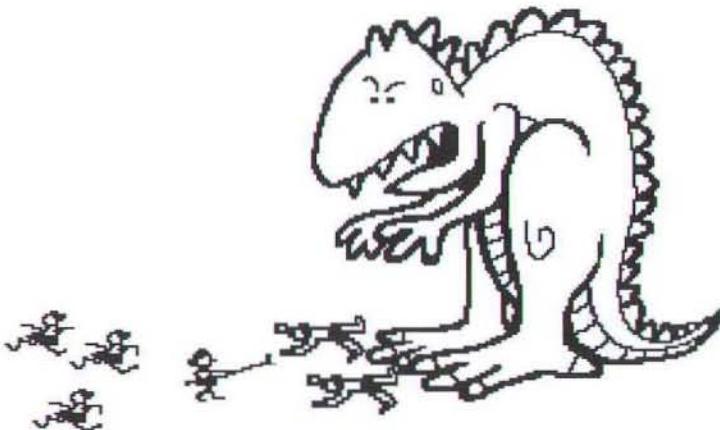
Apple could have created Gershwin from the start, a real multi-tasking OS. For compatibility, it could create a virtual System 7 machine, much like MS Windows creates a virtual machine for DOS programs. This could have been a single thread in Gershwin that emulated a System 7 environment, with 68k emulation and all. Gershwin programs would be 100% native, running on a pre-emptive native OS. If you need to run System 7 software, you have that too. The toolbox APIs could be completely rewritten, no constraints required. Likewise, Apple could have written a new file system that fixes many of the limitations of HFS. The File System Translation Manager would support old "inferior" file systems, much in the same way as we can read and write DOS disks.

Of course, we know none of this will happen. And unfortunately, it also means that we won't see a truly pre-emptive MacOS for at least 4 to 5 years. Boy, that Mac will be great in the year 2000; I can't wait. Don't get me wrong, I love my Mac. It is just disappointing that Apple has stumbled so much for so long.

- Mark Munz, Puppy Dog Software



# Are your projects eating you alive?



Are your projects eating you alive? When time is of the essence the quality of the people and their work means everything...

Swift performs above the standard level. We understand that experience, timing and costs can mean the difference for a successful project. When you need a person or a team to make things happen, call us.

We have provided solutions from the firmware level up. We work with the latest technologies such as Oracle Power Objects, OpenDoc/ODF, & Java to bring the latest options to solving your problems. Our technical services include Project Management, R & D, Training and Technical Support.

Swift can make the difference.  
To see how, call (408) 338-1464.

S W I F T  

---

CONSULTING

610 West Dr.  
Boulder Creek, CA 95006

## File eXpress

**Scriptable Mac-to-Mac document transport tools for both TCP and AppleTalk networks. Yes, both!**

If you crave the ability to send files or folders from within your own Mac based solutions or applications, then File eXpress is the tool for you!

### File eXpress Features:

- AppleTalk and TCP/IP Support
- Built-in Compression of Files
- Fully Asynchronous Operation
- Recordable & Scriptable Engine
- Store-and-Forward Extensions

And all for just \$20 per license! For more information contact us at **Ruskin@eWorld.com**, or download our demo from your favorite archive or on-line service. Yowza!

# ScriptWizard

## Version 1.5

Now shipping. With all the new features that you asked for. ScriptWizard™ is the best-selling OSA/AppleScript script-editing and debugging tool that combines the power of a professional development environment with the ease of use that you expect of Macintosh® software. ScriptWizard improves your productivity by delivering testing and debugging facilities that are as intuitive as they are powerful, including a Variable Watcher, true single-step debugging, rapid script navigation, and more.

### New features...

- True AppleScript statement-level single stepping.
- Scriptable and Recordable.
- Improved text editing, with drag and drop.
- "Native" for both Power Macintosh and 68K.
- Quick access to Dictionaries from a new menu.
- Full control over Toolbar position & visibility.
- Re-sizeable panes in windows.
- Projector-aware for source code control.
- Edit and debug scripts for FaceSpan 2.0.
- and much, much, more...

**Upgrade**

**\$39**

**US price  
still only**

**\$99**

**US Orders: 800 433 4989**

Tel: 510 843 6484. Also sold by APDA & MacTech.  
Full Moon Software. Internet: 'sales@fullmoon.com'  
International Orders: Tel +44 1628 660242. Fax 666084.



# MacHack '96 Call For Papers



Papers at MacHack are one of the important parts of the conference. Some of the papers that have been presented in the past are:

*The Technology of Emulation: 68K on PowerPC*

*Making Mac Listen: A Voice Recognition Toolkit for Macintosh Applications*

*Optimizing Source Code - Getting the most from your Mac*

*Avoiding Landmines and Other Cross Platform %@!*

*Creating a Consistent 3D Interface*

*The Design of Interactive Television Applications*

*The Macintosh as an Internet Server*

If you have a way-cool application, a new technology or new way of doing something, or a good tutorial on present technologies and how they work, we want a paper from you.

Abstracts are required by February 15, 1996. Please submit them to:

jcr6@aol.com with a subject field of "MacHack Abstract"

Correspondence encouraged

Macintosh and Newton are registered trademarks of Apple Computer. All other trademarks are property of their respective holders. MacHack is a trademark of ExpofTech, Inc. Not affiliated with the MacFax™ Group. All rights reserved.



## It's not just the basics anymore !

Advanced courses from Developer University get you up to speed quickly on new Apple technologies

- OpenDoc
- PowerPC
- Newton
- Graphics/Imaging
- Apple Guide

Courses Available as

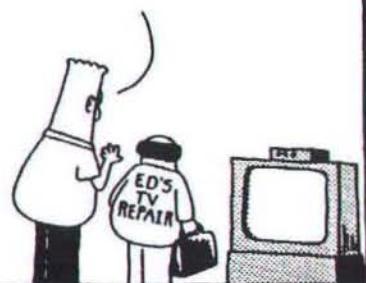


For more detailed information, check out our World Wide Web pages, <http://www.info.apple.com>, or contact the Apple Developer University Registrar at (408) 974-4897 or fax (408) 974-0544.

Developer University, Apple Computer, Inc. 1 Infinite Loop, MS 305-1TU, Cupertino, CA 95014

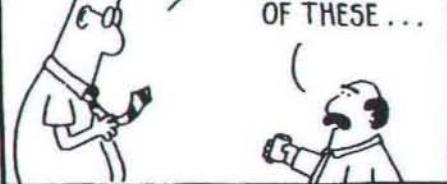
**Dilbert®** by Scott Adams

I'D FIX IT MYSELF BUT I  
KNOW IT TAKES SPECIAL  
TOOLS...



PLUS I WOULD JUST  
HAVE TO ORDER A  
PART... AND I'M  
PRETTY BUSY...

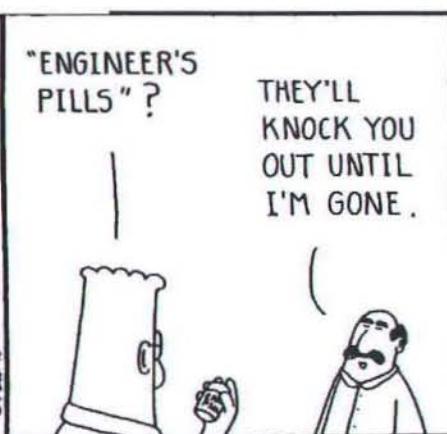
TAKE TWO  
OF THESE...



"ENGINEER'S  
PILLS"?

THEY'LL  
KNOCK YOU  
OUT UNTIL  
I'M GONE.

© 1995 United Feature Syndicate, Inc. (NYC)

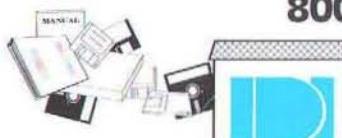


From idea to delivery...



## Complete Software Duplication Service

800-222-6032



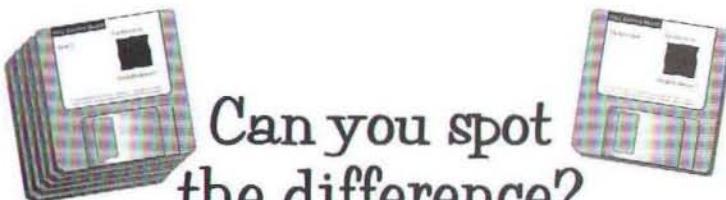
Software Duplication • CD ROM  
Labeling • Assembly  
Printing • Packaging • Shipping

all handled with top

QUALITY ... SERVICE ... SPEED

Authorized Apple Duplicator  
For 11 Years!

International Datawares, Inc.  
2278 Trade Zone Blvd  
San Jose • CA 95131  
(408) 262-6660  
Fax: (408) 262-8906  
Internet: idikds@aol.com



Can you spot  
the difference?

Plenty of people can't. Because whether you update software with a full set of program disks, or a file made with UpdateMaker 2, the result is the same. Guaranteed. UpdateMaker updates are totally **reliable**. Its system of 32-bit checksums ensures that it updates the right file.

And UpdateMaker is **easy-to-use** — simply specify the files and UpdateMaker builds the update. There is no scripting or use of ResEdit. It's even easier for end-users — just one button to press.

UpdateMaker 2 works with any type of Macintosh file. The updater files are extremely **compact**. And the program options numerous. You can preserve or override user customizations. Save files in Binhex format. Update up to 20 old versions with one file.

The real difference is the savings in time and money. Which explains why some of the best-known names in software development have already discovered UpdateMaker 2.

 Distribution is unrestricted and royalty-free.  
Only \$225, order now, fax (415) 964 2886  
AppleLink:MacLab007 Internet:MacLab007@AppleLink.Apple.com

# UpdateMaker 2™

ADInstruments, 2225 Grant Road, Suite #4, Los Altos, CA 94024 Phone: (415) 964 2878

# Programmer Training

MACINTOSH SEMINARS & CONSULTING

Richey Software Training provides professional, customized programming seminars and industry consulting.

Rich content & hands-on lab exercises shorten your learning curve. On-site training is convenient — your team eliminates expensive travel costs and consuming down-time.

“Professional training & consultancy that really hits the mark.”

Call today to find out how Richey Software Training delivers professional seminars and consulting nationwide.



Training Mac Programmers Since 1986  
707•869•2836  
AppleLink: RICHEYSOFT  
INTERNET: 7043.2710@compuserve.com  
P.O. BOX 1809, GUERNSEYVILLE, CA 95446-1809

© 1995 Richey Software Training. All trademarks or registered trademarks are the property of their respective owners. Apple and Macintosh are registered trademarks of Apple Computer, Inc.

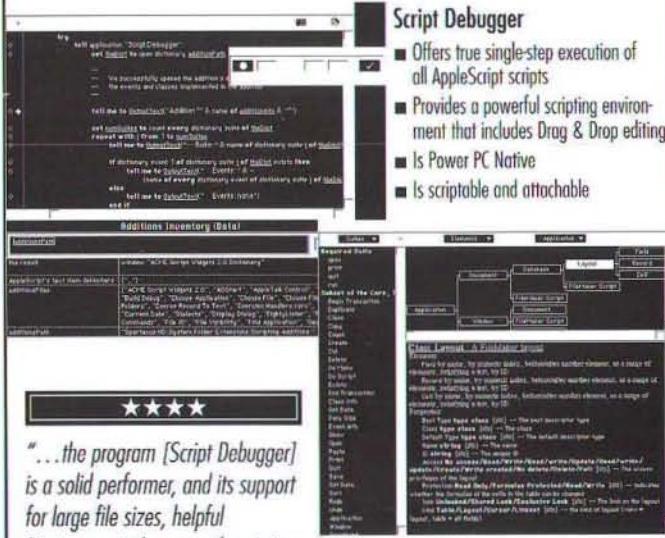
## MAC SEMINARS

- C & C++
- OOP
- MacApp
- PowerPC
- AppleScript
- MPW
- System 7
- Debugging
- SourceBug



# Script Debugger

Script Debugger is a powerful and flexible AppleScript™ authoring tool that makes it easy for novice and experienced script writers to get the most from AppleScript.



★★★

“...the program [Script Debugger] is a solid performer, and its support for large file sizes, helpful

Dictionary window, superb scripting additions and complete scriptability make it a very good choice.”

Avi Rappoport and Ed Allen  
*MacWEEK Magazine*

\$129

Late Night Software Ltd.  
Voice (604) 929-5578  
Fax (604) 929-4961  
E-mail gtubin@winsey.com

Becoming a Macintosh Service Provider continued from page 59

of one to two hundred per month. About 900 listings are currently searchable. Some other Internet experiments and surveys indicate that as many as 5000 Mac OS WWW servers may be publicly available on the Internet. If automated techniques being developed here for listing them work, the number of servers in the listings will grow dramatically before New Year's Day 1996.

## The STAR Site

In an attempt to help focus attention on some of the best sites, a STAR site was established to feature a Mac OS site every few days, and this is the second most popular page at the site. The New Servers listings page is the most popular so far.

## List your Mac WWW sites, public and internal!

If you're considering establishing a Mac OS WWW site, take some time with these listings. If you have at least one Mac OS WWW server, list it! We ask that those who have internal WWW servers, but who still wish to participate in the Mac WWW Server community, list their URL as "internal site," so that NetScape will report "...cannot connect to server... internal site..." In this way all Mac webmasters who wish to can show what they are doing with the technology, and meet and work with others who are attempting similar efforts, whether public or private.



## Developer Tools to Support Adobe™ Technologies

Adobe provides a complete set of tools and services for your development needs. Whether you want to integrate Adobe Acrobat™ capabilities into your applications, add PostScript™ language support to your products or create powerful Graphics Application Plug-ins, Adobe has the tools.

These Software Development Kits now available:

- **Adobe Acrobat™ Plug-ins**
- **Adobe PostScript™ Language**
- **Adobe Photoshop™**
- **Adobe Illustrator™**
- **Adobe Premiere™**
- **Adobe PageMaker™ Additions**
- **Adobe Fetch™ Content Publishers**

To have information faxed to you, call (206) 628-5737 and request documents 1220 and 1233.

Adobe Developers Association  
1585 Charleston Road, Mt. View, CA 94039



```
InitGraf( &qd.thePort );
InitFonts();
InitWindows();
InitMenus();
TEInit();
InitDialogs( OL );
InitCursor();
MaxApplZone();
} // end InitTheMac

static Boolean GetAFile( FSSpecPtr file )
{
    SFTypelist      types;
    StandardFileReply reply;

    StandardGetFile( NULL, -1, types, &reply );
    if ( reply.sfGood )
        BlockMove( &reply.sffile, file, sizeof( FSSpec ) );
    return reply.sfGood;
} // end GetAFile

void main( void )
{
    FSSpec      srcFileSpec;
    OSErr       theErr = noErr;

    InitTheMac();
    if ( GetAFile( &srcFileSpec ) )
        theErr = FSpTrashFile( &srcFileSpec );
} // end main

#endif // TEST_TRASH_FILE
```



### Visit MacTech Magazine's Web site!

<http://www.mactech.com>

To receive information  
on any products  
advertised in this issue,  
send your request  
via Internet:  
[productinfo@xplain.com](mailto:productinfo@xplain.com)

# MENU MILL

is a collection of five menu definition resources (MDEFs) that you just paste into your project's resource file.

Build a menu using the MDEF and then just handle menu selections like any normal menu.



Also contains *Maitre d'*, a special menu development tool that assists you in designing your MENU MILL Menus.

## MENU MILL

- Use your drawing programs as programming tools
- Fast unobtrusive RGB color picker
- Space saving Geneva 9 MDEF
- Calander Menu

JUST... \$69.95

Write, Ariel Publishing, Inc.  
11A Leisure Time Drive,  
Diamondhead, MS 39525  
Call (601) 255-6713  
FAX (601) 255-7086

DEVELOPED BY STAZ SOFTWARE, INC.



# TestTrack™

Bug Tracking the Macintosh Way

TestTrack automates and simplifies tracking your bugs so you can concentrate on fixing them. Easy to set up, easy to use, and quick too!

- Track bugs, change requests, testers, configurations, and more
- Produce concise reports
- Automatically route bugs to team members
- Minimum setup time
- Multiple users, full security

For more information, call or send e-mail to [seapine@one.net](mailto:seapine@one.net)



Seapine Software, Inc.  
1066 Seapine Court  
Maineville, OH 45039  
513.683.6456

# MacRegistry™

## Developer Job Opportunities

If you are a Macintosh developer, you should register with us! We have a database that enables us to let you know about job opportunities. When we are asked to do a search by a client company the database is the first place we go. There is no charge for registering. The database service is free. Geographic Coverage is nationwide.

**Marketability Assessment** - To get a specific feel for your marketability send a resumé via Email or call. You may also request a Resume Workbook & Career Planner.

**Discreet** - We are very careful to protect the confidentiality of a currently employed developer.

**Scientific Placement** is managed by graduate engineers, we enjoy a reputation for competent & professional job placement services and we are Mac fanatics.

**1-800-231-5920 • das@spi.com • Fax 1-800-757-9003**  
<http://www.scientific.com>

## Scientific Placement, Inc.

MT, Box 19949, Houston, TX 77224, 713-496-6100 Fax: 713-496-0373  
MT, Box 71, San Ramon, CA 94583 510-733-6168 beth@spica.bdt.com  
MT, Box 202676, Austin, TX 78720-2676 512-260-0123 lej@zinker.net  
MT, Kenmore Station, Box 15225, Boston, MA 02215 617-424-8372 jen@spbos.pn.com  
AppleLink: D1580; CompuServe: 71250,3001; eWorld: spi; AOL: davesmall



UNITED SOFTWARE EXCHANGE

## PUBLISH YOUR SOFTWARE FREE

United Software Exchange will market your software nationally at no cost to you.

Interested? For no obligation information email Ralph at [USoftEx@aol.com](mailto:USoftEx@aol.com) or call (708) 582-7465.



UNITED SOFTWARE EXCHANGE

### "Object Oriented Code? Sure, between rides!"

**Macintosh Programmers & Adventurers Wanted**  
**MacXperts** is a software development company with immediate openings for Macintosh programmers with C, C++, or other Mac programming experience. Take the first step to adventure. Call Michael Ruttle at:  
1-800-356-8040 or fax / 804-358-3847  
Internet: [xperts@infi.net](mailto:xperts@infi.net)  
AppleLink: [xperts](mailto:xperts) AOL: [MacXperts](mailto:MacXperts)  
<http://www.macxperts.com/~xperts>



### MindVision Software

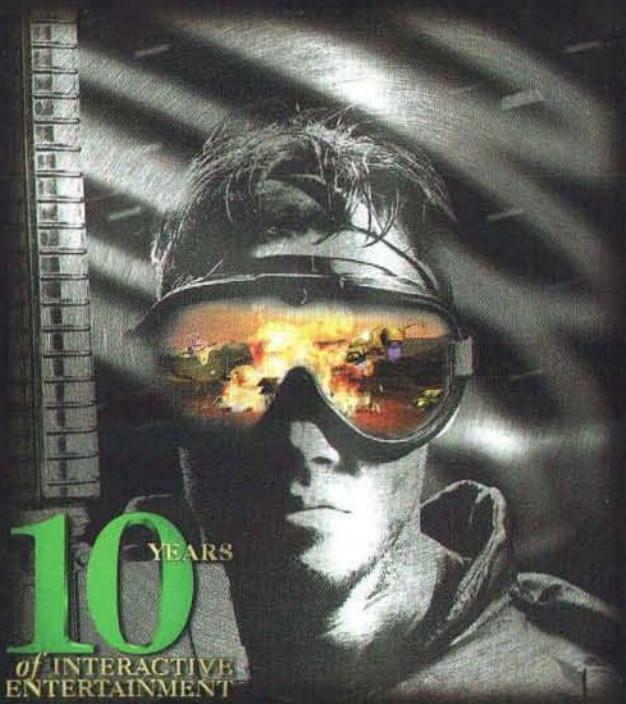
(co-authors of Speed Doubler)  
**wants to pay you well,** insure you and your family, give you lots of vacation time, great equipment to work on, great people to work with, listen to your ideas, and help get your name in the credits of some of the most successful products in Mac & PC history. We ask only that you try as hard for us as we will try for you! If you want to team up with a great software company contact [CouldBeMe@mindvision.com](mailto:CouldBeMe@mindvision.com) Various positions available...

### MacTech Magazine is your recruitment vehicle

When you need to fill important positions at your company, MacTech Magazine is the consistent choice of companies across the country for hiring the best qualified Macintosh programmers and developers. Let MacTech Magazine deliver your recruitment message to an audience of over 27,000 qualified computer professionals.

Call Ruth Subrin at  
805/494-9797

# Westwood<sup>TM</sup> STUDIOS



10<sup>YEARS</sup>  
of INTERACTIVE  
ENTERTAINMENT

Westwood Studios has openings for talented Macintosh Programmers to work in-house. If you have 3 years experience coding C/C++ on the Macintosh, we'd like to hear from you.

We are currently celebrating our 10th year of leading-edge games development. Our most recent hits include

Command & Conquer, Monopoly, The Lion King, Dune II, and The Legend of Kyrandia.

We offer competitive salary and bonuses, an excellent benefits package and a challenging work environment. A move to Las Vegas means no state income tax, affordable housing and outstanding scenery.

## MAC PROGRAMMERS

*For confidential consideration  
please send your resumé Attn: Elsbeth  
Westwood Studios*

*5333 S. Arville, Suite 104  
Las Vegas, Nevada 89118  
fax (702) 368-0677 • phone (702) 368-4850  
email [careers@westwood.com](mailto:careers@westwood.com)  
website <http://www.westwood.com>*

# Got Software for Sale? No Advertising Budget?



Try listing your product in MacTech Magazine's **Mail Order Store**

**Classified Advertising at a cost effective rate!**



For more information, call, fax or e-mail:  
Voice: 805/494-9797 • Fax: 805/494-9798  
Internet: [marketing@xplain.com](mailto:marketing@xplain.com)

*For Macintosh  
Programmers & Developers*

**MacTech**<sup>TM</sup>  
MAGAZINE

By John Kawakami, MacTech Magazine Editorial Assistant



#### **YET ANOTHER PLATFORM FOR CODEWARRIOR: JAVA**

Metrowerks, the leading provider of Macintosh development tools, today announced that it will provide a suite of Java™ development tools, code-named Wired, for the Macintosh platform. In addition, Metrowerks announced it intends to ship the first developer release of the Java tool suite in May, 1996.

The combination of Java, CodeWarrior and the Apple Macintosh makes for a powerful Internet development solution. Sun's Java allows Internet sites to fully incorporate motion and sound, real-time information updates, and user customization and feedback. Apple's Macintosh family of personal computers is heralded as the multimedia development platform of choice, with Dataquest estimating 63% of multimedia content is developed on the Macintosh. Metrowerks' CodeWarrior product line is the market-leading development environment for Macintosh, and is widely credited as a key factor in enabling hundreds of Macintosh developers to make a quick and easy transition to the RISC-based Power Macintosh line.

Using Java, which is syntactically similar to C++, developers can write custom mini-applications called applets. When integrated into Internet web pages, applets can enable expert graphics rendering and real-time interaction with users, live information updating, and instant interaction with servers on the Internet. Applets are downloadable from any server and run safely on any platform.

Metrowerks will provide full Java support in its Macintosh hosted CodeWarrior products. The company anticipates that the first developer release of Java for the Macintosh will be ready for CodeWarrior 9, which is expected to be available at Apple's Worldwide Developer Conference in San Jose, California in May 1996.

Metrowerks:  
<mailto:info@metrowerks.com>  
<http://www.metrowerks.com>  
 Sun:  
<http://java.sun.com>

#### **APPLE'S NOW HAS CREATOR CODE REGISTRATION ON THE WORLD WIDE WEB**

If you haven't been registering your type and creator codes with Apple because their Hypercard based registration system is out of date and inconvenient, well, you now have no more excuses. Apple has put type and creator registration forms on the web, and registration is faster and more convenient than ever. Fill

out the form and submit it to Apple, and you receive a confirmation or denial of your request around 48 hours later.

Also at this website, Apple has also implemented a searchable database so potential registrants may verify that their choice is unique. Developers can search up to sixteen codes at a time to see if they have been assigned. Owner information related to the codes, such as company, contact, address, phone, etc., is confidential. Also available on their web is general information about registration and other creator code related information.

A form to register your file type and creator codes:

<http://dev.info.apple.com/cftype/main.html>

A form to search the database:

<http://dev.info.apple.com/cftype/find.html>

#### **APPLE DELIVERS OPENDOC FOR MAC OS, ON SCHEDULE**

Delivering on its promise to complete the development of OpenDoc component software technology in 1995, Apple Computer, Inc. today announced the availability of the OpenDoc for Mac OS Software Development Kit (SDK), which contains the completed OpenDoc software as well as sample code and tools for development of OpenDoc-based solutions. Demonstrating their support, 300 software developers who have been working with early versions of the SDK, made commitments to deliver OpenDoc-based components to their customers in 1996. These commitments mark the beginning of the evolution toward component-based software aimed at making computing easier for all users.

"By shipping OpenDoc, we've taken the first big step toward the next generation of personal computer software," said David Nagel, Apple's senior vice president of worldwide research and development. "As Apple and others make OpenDoc-based solutions available in 1996, computers will become more easily customized for the needs of specific users, and we'll see small innovative software developers returning to the software business. And because OpenDoc is created by an open alliance, computer customers will get more freedom of choice and won't be tied to the arbitrary decisions of a single company."

Apple plans to deliver the OpenDoc technology to its customers as part of the Mac OS, through hardware bundling and in component-based products throughout 1996. Apple also is actively incorporating OpenDoc technology into its system software.

The OpenDoc for Mac OS SDK includes OpenDoc system software for Power Macintosh and 680x0-based systems, sample

code, full documentation, and a set of development tools. Apple also plans to deliver versions of OpenDoc in 16 additional languages in early 1996. Developers can download the entire SDK beginning on November 10, 1995 through the World Wide Web at <http://www.opendoc.apple.com> or send email to [opendoc@apple.com](mailto:opendoc@apple.com) to receive a free developer CD by mail. *[There will be a copy of the OpenDoc 1.0 CD in the February issue of MacTech - watch for it! Pub. nst]* Developers can also download additional development tools from Apple, Metrowerks and Symantec, including a pre-release version of Apple's OpenDoc Development Framework (ODF) for Mac OS.

### Component Validation Services

CI Labs, the vendor-neutral industry association for distributed component technologies, last week announced its plans to roll out component validation services in the first half of 1996. These services along with an accompanying logo program will deliver on the promise of interoperability that CI Labs has pledged to provide.

### The Promise of Cross-Platform Component Software

The availability of the OpenDoc for Mac OS marks the first of four platform implementations planned to ship over the next year. In addition to Apple's plan to deliver OpenDoc for the Mac OS, IBM Corporation has announced plans to deliver OpenDoc for AIX, OS/2, Windows NT and Windows '95.

### OpenDoc Support Grows

More than 300 developers have stated their support for OpenDoc for Mac OS and their intention to deliver products to the market in 1996. This list grows daily as an increasing number of ISVs see the opportunities to use component software to deliver innovative products to their customers.

Interspersed among the 300 well known and unknown companies planning to support OpenDoc are a handful of unlikely OpenDoc developers including the following: Kinko's is a US based chain of photocopy shops; Pac Bell Directory publishes yellow pages phone books; Viacom is the media giant that owns the cable network, MTV; and Virtual World Entertainment runs a chain of "virtual reality" entertainment centers where you go into a fake "cockpit", complete with switches and lights and a big computer monitor, and wage a simulated Robotech/Battlemech war on your friends. OpenDocVR?

The complete list of committed companies is at:

<http://www.opendoc.apple.com/committed.html>

The very attractive OpenDoc homepage, where you may download OpenDoc and the ODF, is at:

<http://www.opendoc.apple.com>

### ICONIX DEBUTS OBJECT ORIENTED METHODOLOGY TRAINING ON CD-ROM

Longtime object oriented programming tools developer and

training consultants, ICONIX, noted that programmers were requiring more education and training about OO methodologies. As president, Doug Rosenberg, commented, "ICONIX has been fighting CASE tool feature wars for the last eleven years. A few years ago we realized that adding more features to our CASE tools wasn't increasing the success rate of our clients on their projects, and that we needed to deliver methodology training directly to the desktop.

"Our first CD-ROM training course 'An Object Methodology Overview' provides a good start in that it helps to understand the big picture of OO methods in an incredibly short time, but our customers have been very clear in expressing their need for 'on-line methodology help' with the same level of detailed instruction we provide in our on-site training."

Anticipating the trend that has brought Booch, Rumbaugh, and Jacobson together in an effort to unify their methods, the CD-ROM titled "A Unified Object Modeling Approach" offers extensive tutorials on the strengths of each method: Jacobson for user-driven requirements and traceability across the lifecycle, Rumbaugh for domain analysis and reuse across multiple projects, and Booch for detailed C++ design. In addition, prototyping is stressed as a requirements definition technique, with extensive explanations on how to derive Use Case and Domain Object Models from prototypes.

ICONIX Software Engineering, Inc (ph. (310) 458-0092):  
<http://www.biap.com/iconix/>

### MACHACK WINNER, CYBERFINDER, GOES COMMERCIAL

Aladdin Systems began shipping CyberFinder 2.0, a utility which gives Macintosh users an easier way to navigate the Internet. Based on a entry to the hack contest at MacHack, CyberFinder is a control panel which allows users to create new types of Finder icons, called "bookmarks," that point to sites on the Internet. Double click on a bookmark, and the proper application launches and resolves the URL.

CyberFinder 2.0 sports a nifty notable feature, "HotKeys", which will allow users to go to Internet sites from within any application they happen to be using. The user simply selects the URL, presses the HotKey, and voilà, instant gratification. Now you don't have to wait for your favorite email client to add Internet Config support! There's also another handy HotKey which will "grab" a selected URL and produce a bookmark in a designated folder.

If you need CyberFinder, you already know it. The price is US\$30. There's the original version at the MacHack site below, and a fifteen day demo at the following:

<http://www.aladdinsys.com>  
<ftp://ftp.aladdinsys.com>

The original MacHack entry was also called CyberFinder and is available at:

<ftp://ftp.machack.com/Hacks95/CyberFinder.sit.bin>



# MailOrderStore

HOT  
ITEM!

SPECIALS • EXCLUSIVES • HOT ITEMS!

NEW!

**Learn C on The Macintosh Second Edition** By Dave Mark: Learn C on The Macintosh Second Edition: This is a completely revised edition of Learn C on The Macintosh. With this self-teaching, easy-to-understand book and the enclosed CD-Rom, you get everything you need to start programming in this widely used language. New to this edition are updated and enhanced exercises that lead you step by step through the programming fundamentals and C language basics including function, variables, pointers, datatypes, data structures, and the file input and output. Also new is completely rewritten code, plus answers and source code for all of the exercises. The new CD-ROM with Metrowerks Code Warrior™ Lite, a special version of one of the hottest Macintosh programming environments, (including a PowerPC version). \$34.00 \$31.45

**Tricks of The Mac Game Programming Gurus** is the ultimate resource for beginning to expert game programmers who already have general programming experience. Complete overview of all the necessary components of game programming on the Macintosh. Hundreds of tips, tricks, and insider secrets from Mac game programming experts on a CD-ROM, packed with valuable tools, utilities, sample code, Code Warrior™ Lite and game demos. Coverage of cutting-edge topics such as QuickDraw 3D and Power Mac optimization and inside info on how Glypha III was created. Unique in the

marketplace — no other Mac game programming book is this complete! The book contains instruction, tips, and source code from the top names in Mac game development today. The secrets, examples, and code can't be found anywhere else! These are the tried-and-true tricks that work behind the scenes in the most popular commercial and shareware Mac games. Throughout the book, you'll find special interviews with some of the most well-known Mac game programmers. They reveal their secret solutions created while they developed their popular games. \$60.00 \$45.00

**OOFILE** is the first OODBMS framework to offer a complete solution for application authors. Replaceable backend database, currently Faircom's c-tree Plus for cross-platform royalty-free power. PowerPlant and other frameworks integrated with edit fields, database browsers & more. AppMaker users, generate complete applications. User-friendly syntax makes it easier to migrate from FoxPro and the non-OO world. Demo's on CodeWarrior and AppMaker CD's. \$900 for a once-off c-tree bundle, or \$1,095 1-year subscription. HTML and character-mode report-writer \$195. Full GUI report-writer, including HTML, is \$495. Mac Platform Bundle - includes all Mac frameworks, c-tree, and Report-Writer. \$1,495

**PowerTap™** accelerates software by tapping into multiple processors. Version 3.0 taps into

networked Macs and all processors found in the new multi-processor Macs. Developers can speed up their applications without having to learn about networking, communications and task scheduling algorithms. The PowerTap™ library has the easiest API - it behaves as a simple black box where tasks are submitted and results retrieved. Full error recovery is built-in, so your job will complete no matter what. PowerTap's advanced scheduling algorithms ensure optimal assignments and the fastest execution possible. It is compatible with all Macintosh hardware, software and major compilers. Version 1 comes with 2 remotes - \$1200 Version 2 comes with 5 remotes - \$1900 Version 3 comes with unlimited remotes - \$2700

**Roaster DR1™** - Be the first Macintosh developer on your block to take advantage of the unique capabilities of Sun's™ new Java™ Programming Language! Developer Release 1 of Roaster™, new from Natural Intelligence, Inc., is the first ever development environment for writing, testing, and running Java™ applets on the Macintosh. Features include: fully integrated development environment - project window that includes a Finder-like view of packages - lightning-fast - Macintosh native compiler - source code editor with powerful search features and intuitive user interface - runtime engine for quick and easy applet testing. When you purchase Roaster™, you are entitled

to: unlimited, personalized tech support throughout the length of your subscription DR 1, DR 2, Roaster 1.0, and one additional update. Roaster™ is accelerated for Power Macintosh. Requirements Macintosh or Macintosh compatible computer with a Motorola 68020 or higher or Power PC processor; CFM-68K (for 68K machines); 8MB RAM; Color QuickDraw; System 7.1.2 or later; (System 7.5 or later for 68K machines); CD-ROM drive to install the software. Price: \$399 Special Price: \$299

**Symantec C++** is the industry-standard Macintosh development system—and now it's native for Power Mac. You can develop full-featured Power Macintosh applications quickly and easily using revolutionary new features that save time and enhance your productivity throughout the development cycle. Environment includes: A true native Power Mac implementation of the C++ language, including support for templates and multiple inheritance; MRC/MRC++ compilers for fast Power Mac executable code (22% faster than with the standard Symantec or Metrowerks compilers); Visual Architect for fast, easy GUI generation; A new THINK project management system that supports large, complex applications, nested projects, and hierarchical project organization; A new editor/browser that displays classes and automates many editing functions; A powerful, easy-to-use source code debugger; The industry-standard THINK Class Library; Free subscription—receive the next two updates

## MACTECH MAGAZINE PRODUCTS & ORDER INFORMATION



### MACTECH MAGAZINE PRODUCTS & ORDER INFORMATION

E-mail, Fax, write, or call us. You may use your VISA, MasterCard or American Express; or you may send check or money order (in US funds only): MacTech Magazine, P.O. Box 5200, Westlake Village, CA 91359-5200, Voice: 805/494-9797, Fax: 805/494-9798

If you are an e-mail user, you can place orders or contact customer service at:

- AppleLink: MT.CUSTSVC
- CompuServe: 71333.1063
- Internet: custservice@xplain.com
- America Online: MT.CUSTSVC
- GEnie: MACTECHMAG
- eWorld: MT.CustSvc

**MACTECH WEB™ SITE:**  
<http://www.mactech.com>

For complete product info

### SUBSCRIPTIONS

US Magazine: \$17 for 12 issues  
Canadian: \$59 for 12 issues  
International: \$97 for 12 issues

US Magazine with Source Code Disk:

\$124 for 12 issues

Canadian Magazine w/Source Code Disk:

\$136 for 12 issues

International Magazine w/Source Code Disk:

\$194 for 12 issues

### CD-ROM

**MacTech CD-ROM, Volumes 1-10:** Includes over 1230 articles from all 115 issues (1984-1994) of MacTech Magazine (formerly MacTutor). All article text and source code. Now in THINK Reference format. The CD includes Symantec's THINK™ Reference 2.0, working applications with full documentation, product demos for developers and more. See advertisement, this issue: \$49. Upgrades \$39. E-mail, call or write for info.

### BOOKS

*The Best of MacTutor, Vol. 1: Sold Out*  
*The Complete MacTutor, Vol. 2: Sold Out*  
*The Essential MacTutor, Vol. 3: \$19.95*  
*The Definitive MacTutor, Vol. 4: \$24.95*  
*The Best of MacTutor, Vol. 5: \$34.95*

*Best of MacTutor Collection, Volumes 3 - 5: \$69*

*Best of MacTutor, Volumes 6, 7, 8 & 9: Not available*

### DISKS

Source Code Disks: \$8 each  
Topical Index (1984-1991) on disk: \$5

### MAGAZINE BACK ISSUES

Volumes 3, 4, 5, 6, 7, 8, 9 and 10:  
\$5 each (subject to availability)

California residents include 8.25% sales tax on all software, disks and books.

Allow up to 2 weeks for standard domestic orders, more time for international orders.

### PLEASE NOTE

Source code disks and journals from MacTech Magazine are licensed to the purchaser for private use only and are not to be copied for commercial gain. However, the code contained therein may be included, if properly acknowledged, in commercial products at no additional charge. All prices are subject to change without notice.

SPECIALS • EXCLUSIVES • HOT ITEMS!

free when you send in your registration card and more! Price: \$399

**Symantec C++ for 68k**, allows you to build applications faster and easier with the powerful combination of fully integrated visual tools and the latest in C and C++ compiler technology. C++, now the standard in development languages, provides an object-oriented approach to application development, and the resulting code is extensible, reliable, and maintainable. Includes: Integrated Environment with full source-code debugging, integrated editing and browsing, and resource creation and editing; support for standard language features such as templates and multiple inheritance as well as quick compile times and highly optimized code; Incremental Linker which eliminates long link times; THINK Class Library – a mature, C++ based, application framework provides a solid foundation on which to build factored and scriptable applications with support for C++ exceptions, run-time type identification, persistent objects, and AppleEvents; Visual Architect™ to visually design your user interface and automatically generate complete THINK Class Library source code; THINK Inspector which provides you with quick and easy navigation of your application's class hierarchy while it is running; Project Models to start new projects quickly from templates either provided in this package or created to fit your own needs; Source-Code Control with integration with Apple's SourceServer (included) provides reliable version control and supports team programming; Support for Scripting lets you automate complex, multiproject operations using AppleScript or Frontier scripting; Powerful Standard Libraries which includes IO Streams, ANSI standard C library, and sample programs. Full source code is included; Extensibility supports third-party editors, and AppleScript and MPW tools (available from Apple) and allows access to THINK Reference; Create applications; desk accessories; device drivers; and any kind of code resource, including HyperCard XCMDs and XFCNs, system extensions, and control panels; Migration Path to Power Mac – Create applications that run on 68K Macs and Power Macs (emulated). These applications can easily be migrated to native Power Mac, by trading up to Symantec C++ for Power Mac. Price: \$79

**Mastering the THINK Class Library** by Richard Parker

Parker. Now that Symantec's long-awaited PowerPC native compiler is here, developers are taking another look at THINK. This book provides a thorough examination of Symantec's extensive Class Library and the Visual Architect, a graphic user interface development tool that allows you to produce commercial-quality applications with a minimum of effort. A complete description of the structure and operation of the TCL, includes explanations of all code generated

by the Visual Architect, any necessary custom code, and the operation of this code. Visual Architect tutorials provide you with a step-by-step approach for simplifying the development of complex Macintosh applications. 496 pages ~~\$29.95~~ **\$26.96**

**A Fragment of Your Imagination** by Joe Zobkiw NEW!

Here's some practical help for creating code resources and code fragments for the Macintosh and Power Macintosh. Rather than simply gathering and indexing chunks of this vital code, the author provides thorough explanations to teach you more about how the Macintosh system functions as a whole. He also provides hard-to-find information about techniques used to structure and build fat, safe fat, and accelerated code resources for use on both 680x0 and Power Macintosh. All code is reusable and is provided on the disc, along with Metrowerks Code Warrior Lite. Book/CD-ROM, 528 pages ~~\$39.95~~ **\$35.96**

**Inside CodeWarrior 8:** NEW!

Includes CodeWarrior IDE User's Guide. This manual shows you how to use the CodeWarrior IDE (Integrated Development Environment).



It shows you how to create software for 68K and PowerPC Mac OS, Win32/x86, and Magic Cap.

It also shows you how to use ToolServer from the IDE and how to control the IDE using AppleScript. The next highlight is CW Error Messages, which describes the errors you might encounter while using CodeWarrior compilers and linkers. This manual contains descriptions, source code examples, and fixes to these errors, as well as the Debugger Manual, which was updated for CW7 including new inline and exceptions debugging, and a new troubleshooting section. Next up is the MPW Tools Manual, which shows you how to use Metrowerks compilers, linkers, and other tools under the MPW Shell. Updated for CW7, new chapters comparing Metrowerks and other MPW tools, and then onto C, C++, and Assembly, and Pascal Language Reference, covering the Metrowerks implementation of C, C++, and 680x0 assembly language programming, updated for CW7. The Pascal refs also include the new UNSIGNEDWORD and UNSIGNEDLONG. Also included for this time are Profiler and ZoneRanger Manuals updated for CW8. \$34.95

**Inside PowerPlant** is the NEW! Power-Plant Manual, and contains

information about creating PowerPlant applications using the CodeWarrior IDE and PowerPlant Constructor, and describes major PowerPlant classes and resources. Also included are the PowerPlant Constructor Manual, including

View, TextTraits and Custom Types editing, and PowerPlant Library Reference, covering all classes and functions in PowerPlant, updated for CW8. \$34.95

**BBEdit 3.5** from Bare Bones Software

is now better than ever. In addition to being Accelerated for Power Macintosh, this powerful, intuitive text editor offers integrated support for THINK C 7.0, Metrowerks CodeWarrior 6, THINK Reference 2.0 and MPW ToolServer. Version 3.1 adds even more capability, including "soft" wrapping of text on screen and numerous refinements and improvements to the user interface. BBEdit's many features include: Integrated PopupFuncs™ technology for speedy navigation of source code files (C, C++, Pascal, Rez, 68K Assembler, and Fortran), unique 'Find Differences' command (BBEdit can find differences between projects and folders as well as files), support for Macintosh Drag and Drop for editing and other common tasks, PowerTalk support for reading, sending and composition of PowerTalk mail, scripting via any OSA compatible scripting language including AppleScript and Frontier 3.0, and fast search and replace with optional "grep" matching and multi-file searching. BBEdit's robust feature set and proven performance and reliability make it the editor of choice for professionals and hobbyists alike. \$99

**QC™** by Onyx Technology, is a system extension that stress tests code during runtime for common and not-so-common errors. Tests include heap checks, purges, scrambles, handle/pointer validation, dispose/release checks, write to zero, de-reference zero as well as other tests like free memory invalidation and block bounds checking. QC is extremely user friendly for the non-technical tester yet offers an API for programmers who want precise control over testing. QC is Also available in Japanese. \$99.95

**FaceSpan™ v2** is an extensible Rapid Application Designer (RAD) that makes building applications quick and easy. It combines an interactive, visual interface design environment with the object-oriented power of AppleScript or any OSA language. Best of all, FaceSpan allows you to integrate the capability of scriptable programs into your custom application. Your FaceSpan applications can include any number of windows, dialogs, palettes, and menus. In them, you can display scrolling lists, popup menus, scrolling text, movies, multi-column tables, pictures, icons, buttons, and others. While no scripting is needed for standard behaviors, every item may have its own script. You can even program custom objects using Pascal or C. Try the perfect choice for MIS professionals, power users, consultants, and programmers. They ♥ FaceSpan!

Includes a royalty-free distribution license, for unlimited runtime users, of your FaceSpan-based applications. Also included is a FREE UPGRADE to the next version for registered users. \$199

**Scripter®** The Authoring and Development Environment for AppleScript™. Scripter, the Script Construction Set, is the foremost, comprehensive tool for creating and debugging AppleScript scripts. Scripter is a shortcut to Applescript's full capabilities, is both powerful and easy to use, and appeals equally to novices and experts. Scripter offers the largest collection of tools to answer the needs of every AppleScript user, containing over 35 features, including: **Superior vocabulary access** – point-and-click assembly of commands and object specifications; **Shortcuts and extended editing capabilities** – extensive drag-and-drop, six-function find-and-replace; navigation markers; script library collection facility; many other timesavers for faster scripting. **Interactive debugging** – comprehensive variable watcher, expression evaluation, enhanced trace log, and real single step debugging! Other features include: integration with FaceSpan and background processing. Unlike other scripting tools, which are either based on the original Script Editor concept, or are designed to look more like traditional programming tools, the designers of Scripter understood from the outset that scripting is different from writing C code. Scripter will change the way you work with AppleScript. From expert script design to user-friendly editing and implementation, Scripter is the natural companion to AppleScript for all levels of proficiency. \$199

**Macintosh Programmer's Toolbox Assistant CD-ROM** – Instant electronic access to Inside Macintosh essentials. Now Macintosh programmers can get quick access to over 4,000 Toolbox calls that are at the heart of Macintosh system software. The definitions of these data structures, resources, constants, and functions are documented in the Inside Macintosh series and are essential information for anyone developing Macintosh software. Macintosh Programmer's Toolbox Assistant is a CD-ROM that harnesses the power of one of the best search and viewing engines in the industry. It allows programmers to access the Toolbox calls quickly from their development environment. With hypertext links allowing programmers to view related topics easily. Macintosh Programmer's Toolbox Assistant is the ultimate electronic reference tool for Macintosh programmers. **\$99.95**

**Inside Macintosh®: CD-ROM** by Apple Computer, Inc. Inside Macintosh is the essential reference for programmers, designers, and engineers for creating applications for the Macintosh family of computers. Inside Macintosh CD-ROM

## SPECIALS • EXCLUSIVES • HOT ITEMS!

collects more than 25 volumes in electronic form, including: QuickDraw™ GX Library, Macintosh Human Interface Guidelines, PowerPC System Software, Macintosh Toolbox Essentials and More Macintosh Toolbox, QuickTime and QuickTime Components. Now programmers will be able to access over 16,000 pages of the information they need directly from their computers. Hypertext linking and extensive cross referencing

across volumes allows programmers to search and explore this library in ways that are unique to the electronic medium. Every Macintosh programmer will regard Inside Macintosh CD-ROM as their most important resource. **\$99.95**

**ScriptWizard™** 1.5 is the latest version of the best-selling script-editing and debugging tool that combines the power of a professional

development environment with the ease of use that you expect of Macintosh™ software. Compatible with all Apple® Open Scripting Architecture languages, including AppleScript™, ScriptWizard improves your productivity by delivering testing and debugging facilities that are as intuitive as they are powerful. ScriptWizard makes life easier for scripters by emphasizing features that speed script development. Some of the most significant enhancements to scripter

productivity include the ability to single-step scripts (now allowing true statement-level stepping), watch variable values as scripts execute, jump instantly to frequently used places in a script and find and replace specific text. Full drag and drop text editing is supported. ScriptWizard delivers an intuitive development, testing, and debugging environment for rapid script creation with essential tools up-front for easy access. **\$89**



**Advanced Color Imaging on the Mac OS** By Apple Computer Inc. **\$33.26**

**OpenDoc Programmer's Guide** By Apple Computer Inc. **\$40.46**

**Plan and Manage Web Sites on the Mac** By Wiederspan/Shotten **\$35.96**

**Sex, Lies and Video Games** By Hensler **\$31.46**

**Tog on Software Design** By Tognazzini **\$26.96**

See pages 18 & 19 for more information



**Advanced Color Imaging on the Mac OS** By Apple Computer Inc. **\$33.26**

**OpenDoc Programmer's Guide** By Apple Computer Inc. **\$40.46**

**Plan and Manage Web Sites on the Mac** By Wiederspan/Shotten **\$35.96**

**Sex, Lies and Video Games** By Hensler **\$31.46**

**Tog on Software Design** By Tognazzini **\$26.96**

See pages 18 & 19 for more information

**Learn C on The Macintosh Second Edition** By Dave Mark: See page 100

**Tricks of The Mac Game Programming Gurus** See page 100

**Macintosh C Programming Primer Volume I, Second Edition, Inside the Toolbox Using THINK C** by Dave Mark and Cartwright Reed. This new edition of this Macintosh programming bestseller is updated to include recent changes in Macintosh technology, including System 7, new versions of THINK C and ResEdit, and new Macintosh machines. Readers will learn how to use the resources, Macintosh Toolbox and interface to create stand-alone applications. 672 pages. **\$26.95 \$24.25**

**Macintosh C Programming Primer Volume II, Mastering the Toolbox Using THINK C** by Dave Mark. Volume II picks up where Volume I leaves off, covering more advanced topics such as: Color QuickDraw, THINK Class Library, TextEdit, and the Memory Manager. 528 pgs. **\$26.95 \$24.25**

**Macintosh OLE2 Programmer's Reference: Working With Objects:** Provides a complete reference to the extensible protocol of

## BOOKS

10% OFF  
ALL BOOKS!

language. **\$20.99 \$26.99**

**Writing Localizable Software for the Macintosh** by Daniel R. Carter. 469 pages. **\$26.95 \$24.25**

**Global Interface Design, A Guide to Designing International User Interfaces** by Tony Fernandes, AP Professional. Global Interface Design addresses the issues involved in product development for a global market with a "real world" focus. While covering major areas developers should address during the development cycle, Tony Fernandes provides insight into researching cultural differences. This book examines the differences found all over the world, such as cultural symbolism and taboos, and how they impact user interfaces. **\$34.95 \$32.35**

**Taligent's Guide to Designing Programs: Well-Mannered Object-Oriented Design in C++** **\$19.50 \$17.55** Call for more information.

**Software By Design: Creating User Friendly Software** by Penny Bauerfeld (Series Editor: Tony Meadow). This excellent reference provides readers with a thorough how-to for designing software that is easy to learn, comfortable to operate and that inspires user confidence. Written from the perspective of Macintosh, but compatible with all platforms. Stresses user input from initial design, through prototyping, testing and revision. Provides tools for analyzing user needs and test responses. Includes exercises for sharpening user-oriented design skills. **\$29.95 \$26.95**

**Macintosh Programming Techniques** by Dan Sydow (Series Editor: Tony Meadow). This tutorial and handbook provides a thorough foundation in the special techniques of Macintosh programming for experienced Macintosh programmers as well as those making the transition from DOS, Windows, VAX or UNIX. Emphasizes programming techniques over syntax for better code, regardless of language. Guides the reader through Macintosh memory management,

**Object Linking and Embedding, version 2.01 for Macintosh System 7.** Understanding of C/C++ helpful, but not necessary, and comes with a CD. Working With Objects describes the visual and interactive interfaces that support the component objects, provides details of the OLE 2.01 for the Macintosh user interface, addresses the issues of object class registration, shows how to implement the drag and drop objects from one application to another, covers the interface that exposes the basic embedding functionality, and includes descriptions of API functions. **\$44.95 \$40.45**

**Macintosh Pascal Programming Primer Volume I, Inside the Toolbox Using THINK Pascal** by Dave Mark and Cartwright Reed. This tutorial shows programmers new to the Macintosh how to use the Toolbox, resources, and the Macintosh interface to create stand-alone applications with Symantec's THINK Pascal. 544 pages. **\$26.95 \$24.25**

**Learn C++ on the Macintosh** by Dave Mark. After a brief refresher course in C, Learn C++ introduces the basic syntax of C++ and object programming. Then you'll learn how to write, edit, and compile your first C++ programs through a series of programming projects that build on one another as new concepts are introduced. Key C++ concepts such as derived classes, operator overloading, and iostream functions are all covered in Dave's easy-to-follow approach. Includes a special version of Symantec C++ for Macintosh. Book/disk package with 3.5" 800K Macintosh disk. 400 pages. **\$36.95 \$33.26**

**Programming Primer For The Macintosh® Volume 1** by John Whittle and Judy May. This book provides an introduction to Macintosh programming, using C++ as the example language, and provides realistic, easy to follow, programming examples designed to work with either Symantec C++ or Metrowerks® CodeWarrior®. Also includes one 3.5" disk with source code for the programming examples, along with numerous, useful, public domain utilities to use with each compiler. **\$37.95 \$34.15**

10% OFF  
ALL BOOKS!

BOOKS

QuickDraw, events and more, using sample program in C++. Disk includes an interactive tutorial, plus reusable C++ code. \$34.95 **\$31.95**

**More Mac Programming Techniques:** *More Mac Programming Techniques* goes beyond the fundamentals of Macintosh programming. With this hands-on guide and tutorial, you'll expand on the basic foundation of programming to develop truly powerful applications. Inside you will take a detailed look at the units of a Macintosh program – from the INITs to custom controls. Along the way, you'll learn solid techniques you can apply anywhere, including tricks and techniques. You will learn file resources from the ground up, and how to build custom menus, add custom controls, including buttons, and slider controls, MDEF, and CDEF resources. The book will also help you to handle INITs, making preference files, and how to print flawlessly from your programs. \$39.95 **\$35.95**

**Macworld Ultimate Mac Programming** by Dave Mark. Reveals the secrets of Mac programming and presents important timesaving techniques. **\$39.95 \$35.95**

**Mac Screamer, The Ultimate Macintosh® Supercharging Kit** by Jan Harrington covers 30 Macintosh models, including the Classics, LCs, PowerBooks, and Quadras and gives software solutions and hardware tips to accelerate Mac performance. It lets readers in on do-it-yourself tips that can save them over 25% on upgrade costs. **\$35.00 \$31.50**

**Programming for System 7** by Gary Little and Tim Swihart, is a hands-on guide to creating applications for System 7. It describes the new features and functions of the operating system in detail. Topics covered include file operations, cooperative multitasking, Balloon Help, Apple events, and the File Manager. Numerous working C code examples show programmers how to take advantage of each of these features and use them in developing their applications. 384 pages. **\$26.00 \$24.25**

**Guide to Macintosh System 7.5** by Don Crabb. Written by an industry expert, this is the first thorough book on the new and improved Macintosh operating system. Readers will learn all the highlights of the new System, including how to work efficiently with applications. Intuitive, task-oriented approach teaches topics the way users think, not the way the machine thinks. Covers all the new features of System 7.5, including PowerTalk, PC Exchange, and MacTCP. Written by a world-renowned Mac expert. **\$25.00 \$22.50**

**A Fragment of Your Imagination** by Joe Zobkiw. See page 101

**How To Write Macintosh Software** by Scott Knaster is a great source for

understanding Macintosh programming techniques. Drawing from his years of experience working with programmers, Scott explains the mysteries and myths of Macintosh programming with wit and humor. The third edition, fully revised and updated, covers System 7 and 32-bit developments, and explores such topics as how and where things are stored in memory; what things in memory can be moved around and when they may be moved; how to debug your applications with MacsBug; how to examine your program's code to learn precisely what's going on when it runs. 448 pgs. **\$28.95 \$26.05**

**Danny Goodman's Macintosh® Handbook Featuring System 7** by Danny Goodman with Richard Saul Wurman. It includes over 100 spreads break down and clarify Mac problems and includes insider's tips. **\$29.95 \$26.95**

**Real World Apple Guide, For The Mac** is the much anticipated help and navigational aid component of the new Apple System 7.5 OS. The book is a practical introduction to Apple Guide for programmers. It explains the design and function of Apple Guide, how to design your own guides using Apple Script. Comes with a disk of sample Apple Guides for Apple Guide-compliant applications. **\$39.95 \$35.95**

**Danny Goodman's Apple Guide Starter Kit** by Danny Goodman and Jeremy Joan Hewes. Two highly respected experts offer a different approach for creating your own Apple Guide databases. With Danny's Guide Starter program you can make guides quickly and easily, without having to learn a scripting language, write coded files, or use several different files and programs to produce your database (which is what you'd have to do without the program). The authors provide advice and tips on how to design a good Guide, from planning and creation through testing, revising, and indexing. Book/disk, 320 pages. **\$34.95 \$31.46**

**HyperTalk® 2.2: The Book** Second Edition by Dan Winkler, Scott Kamins, and Jeanne DeVoto is the most complete, authoritative source on HyperTalk 2.2 programming and troubleshooting. It covers each language element of HyperTalk 2.2 (including the odd quirk or bug). **\$35.00 \$31.50**

**The Complete HyperCard® 2.2 Handbook Fourth Edition** by Danny Goodman is the biggest-selling Mac book – newly revised and updated for version 2.2. It shows how to build working applications using the latest version of HyperCard and covers text, painting tools, extension commands (XCMDs), scripting in HyperTalk, and more. **\$35.00 \$31.50**

**Dan Shafer Presents the Power of ProGraph CPX** is a hands-on, project-centered approach to learning the most

**HOT ITEM!** revolutionary object-oriented programming language on the planet. The language Kurt Schmucker likes best. The language that programmers actually report having "fun" programming. This 550-page book takes you step by step through three interrelated projects of increasing complexity. Along the way you'll learn the underlying ProGraph language, how to use the power of lists, and the important aspects of the CPX classes and object editors. Includes disk with all code in the book. **\$49.95 \$44.95**

**Visual Programming With ProGraph CPX** by Scott B. Steinman and Kevin G. Carver. This is the first book on ProGraph CPX available through the book trade. It covers the only commercially supported visual programming language at a time when many programmers and managers, faced with continuing productivity problems, are searching for better programming environments. ProGraph CPX is much more than such GUI-enhanced traditional languages as Visual Basic: It literally allows you to draw your program flow using icons and create a complete application without writing a line of code. This book is an introduction to the language and a guide for advanced users, for both Macintosh and Windows-based machines. ProGraph is a fully pictorial, general-purpose, object-oriented language that speeds development with an integrated environment for design, coding, testing and debugging; with its OO framework for sophisticated GUI development; with its support for calls from C, C++, Pascal, and other routines; with its DAL, ORACLE, Sybase, AS/400 client/server DB support; and many other powerful features. **\$34.00 \$30.60**

**Graphic Gems V** Edited by Alan W. Paeth is the newest volume in The Graphic Gems Series. It is intended to provide the graphics community with a set of practical tools for implementing new ideas and techniques, and to offer working solutions to real programming problems. These tools are written by a wide variety of graphics programmers from industry, academia, and research. The books in this series have become essential, time-saving tools for many programmers. It is the latest collection of graphics tips in The Graphic Gems Series written by the leading programmers in the field. It contains about 50 new gems displaying the most recent and innovative techniques in graphics programming. Also included is new gems in ellipses, splines, Bezier curves, and ray tracing. Includes a disk which contains source code from all five volumes and is available in both IBM and Macintosh versions. CONTENTS: Algebra and Arithmetic, Computational Geometry, Modeling and Transformation, Curves and Surfaces, Ray Tracing and Radiosity, Halftoning and Image Processing, Utilities. **\$49.95 \$44.95**

**Applied Mac Scripting** **NEW!** Applied Mac Scripting covers

AppleScript™, Frontier, QuicKeys, Tempo II, nShell, FaceSpan Application Builder, Scripting PlainTalk and System 7.5. With this hands on tutorial Tom Trinko shows you how to automate your Macintosh activities by learning how to use the AppleScript and Frontier scripting environments. You will learn the overall approach to designing and developing powerful scripts, and to harness the capabilities of a wide variety of Macintosh applications into the integrated productivity tools. This includes such things as the newspaper script which combines the power of SITcomm, MacWrite Pro, and Filemaker Pro, or QuarkXpress. Whether you are a power user or experienced Mac Programmer you will learn valuable new techniques for Mac automation. **\$34.95 \$31.45**

**Danny Goodman's AppleScript Handbook** **SECOND EDITION** by Danny Goodman is a self-contained kit shows the reader how to customize and extend the capabilities of any Macintosh computer – no programming experience needed! This enhanced and expanded edition of The Complete AppleScript Handbook focuses on putting AppleScript to work in all sorts of practical situations. In addition, Danny shows you how to apply the same principles to other popular scripting systems, such as UserLand Frontier and QuicKeys. Shows readers how to use scripts to enhance the Macintosh environment, automate many processes, link data between applications, and much more. This book provides a wealth of all-new examples showing how to integrate AppleScript with the Finder, spreadsheets, desktop publishing programs, graphics applications, databases, telecommunications programs, utilities, and HyperCard. The accompanying 3 1/2" disk is jam-packed with over \$100 worth of software, including AppleScript 1.1, valuable utilities, and powerful, ready-to-use scripts. **\$39.00 \$35.00**

**The Complete AppleScript® Handbook** by Danny Goodman is a self-contained kit to customizing and enhancing the Macintosh environment. The disk contains **HOT ITEM!** AppleScript 1.1 Runtime, Chang Labs TableServer, and useful, ready-to-run scripts. It also shows the Mac user how to automate many processes – no programming experience necessary. **\$35.00 \$31.50**

**The Tao of AppleScript: BMUG's Guide to Macintosh Scripting, Second Edition** by Derrick Schneider & Hans Hansen. This updated bestseller is a complete, natural introduction to AppleScript programming essentials. Readers learn how to customize applications, automate tedious tasks, and create programs without having to use a complex programming language. 2 disks contain AppleScript, QuickTime, StuffIt Lite, ResMover, and other helpful utilities. Progressive structure meets the needs of any

**BOOKS**

Mac user, regardless of experience. Professional instructions are mixed with practical examples for easy learning. **\$29.95  
\$26.95**

**Wireless For The Newton Software Development for Mobile Communications** by Julie McKeehan and Neil Rhodes

**HOT ITEM!** A book that picks up where Programming for the Newton left off, teaching the reader how to develop Newton® software on the Macintosh. The enclosed floppy disk provides a sample application, as well as a fully functional demonstration version of Newton Toolkit™ (NTK™), Apple Computer's complete development environment for the Newton®. Gives hands-on Newton environment training with sample code created specifically for the Newton®. The authors are external faculty at Apple Developer University teaching classes on programming for the Newton®. Programming experience is assumed, although not in any particular language. Enclosed is a floppy disk which contains source code for a Newton application, as well as demonstration NTK™. **\$34.95 \$31.45**

**Basic For The Newton.** Programming for the Newton Using NS Basic by John Schettino & Liz O'Hara. This book shows owners of Newton devices how to become Newton programmers using BASIC. The authors use a straight-forward "programming by example" approach, which should have you writing your own Newton programs right away. It includes one 3.5" disk containing Demonstration NS BASIC and over fifty example programs from the book. It is Multi-platform in that teaches programming for the Newton using a Macintosh, a Windows-based PC, or on the Newton device itself. **\$35.95 \$32.35**

**Programming for the Newton Software Development with NewtonScript** by Julie McKeehan and Neil Rhodes. Foreword by Walter R. Smith. Programming for the Newton: Software Development with NewtonScript is an indispensable tool for Newton programmers. Readers will learn how to develop software for the Newton on the Macintosh from people that developed the course on programming the Newton for Apple Computer. The enclosed 3.5" disk contains a sample Newton application from the books, as well as demonstration version of Newton Toolkit (NTK), Apple Computers complete development environment for the Newtons. A Publication of AP Professional May 1994, Paperback, 393 pp. **\$29.95 \$26.95**

**Metrowerks CodeWarrior Programming** by Dan Parks Sydow.

**HOT ITEM!** Includes CodeWarrior Lite, and Full Coverage of PowerPlant™. The best information on Metrowerks

CodeWarrior 6, giving full coverage to the Gold Edition. Even if you don't already own CodeWarrior 6, you'll still be able to work with the examples in this book, using the CodeWarrior 6 Lite CD that comes with it. **\$39.95 \$35.95**

**C++ Programming With CodeWarrior Beginning OOP for the Macintosh and Power Macintosh** by Jan L. Harrington from AP Professional. This book shows programming novices object-oriented programming techniques for the Macintosh, Power Macintosh, and Mac OS compatibles, using C++ as the example language and Metrowerks and CodeWarrior as the example compiler. The enclosed CD-ROM contains example code from the book and a full-function Metrowerks CodeWarrior compiler for running these examples. **\$35.95 \$32.35****Optimizing PowerPC Code: Programming the PowerPC in Assembly Language** — To take full advantage of the potential of the PowerPC, Developers

**HOT ITEM!** need to master the Assembly Language techniques. This book shows how to use the Assembly Language in PowerPC Programs to produce faster more robust software. **\$39.95 \$35.96**

**Inside CodeWarrior 7:** See page 101

**Inside PowerPlant:** See page 101

**Power Macintosh Programming Starter Kit** by Tom Thompson. This is the first tutorial/reference for programmers who want to enter the new world of the PowerPC chips. Users find all the details on the new microprocessors, the new RISC architecture, and how to write native code and emulation operations to create their own software for the Macintosh PowerPC. CD-ROM includes a unique compiler for writing code easily. The all-in-one book that gets programmers the information and tools they need. Programming examples reinforce explanations of code and programming tools **\$39.95 \$35.10**

**The ResEdit All Night Diner** by David Ciskowski. An idea-filled menu and introduction to the joys of customizing software — and adding personality to the Mac with ResEdit! Shows readers how to customize default icons, the text of menus and dialog boxes, cursors, pointers, and more. Provides specific recipes for doing creative things with ResEdit — plus how to avoid problems. Disk features ResEdit program, plus lots of sample resources **\$24.95 \$22.45**

**ResEdit™ Complete, Second Edition** by Peter Alley and Carolyn Strange. With ResEdit, Macintosh programmers can customize every aspect of their interface from creating screen

backgrounds and icons to customizing menus and dialog boxes. 608 pages. Book/disk package. **\$34.95 \$31.45**

**Sad Macs, Bombs, Disasters and What to Do About Them** by Ted Landau

comes to the rescue with your Macintosh problems. From fractious fonts to the ominous Sad Macintosh icon, this emergency handbook covers the whole range of Macintosh problems: symptoms, causes, and what you can do to solve them. 640 Pages. **\$24.95 \$22.45**

**Macintosh® Crash Course** by Glenn Brown shows Macintosh power users what to do when things go wrong with their system. Macintosh Crash Course shows readers how to overcome Macintosh system crashes, system lock-ups, and various, frustrating and cryptic error messages they regularly encounter. It includes a CD-ROM with shareware and freeware to help the user diagnose and repair system failures. Includes up-to date coverage through Macintosh System 7.5. Managing memory, Hardware diagnostics, File recovery, PowerBook problems, PowerPC problems, network utilities, hard drive repair utilities, SCSI problems, conflicts and solutions and File synchronization and utilities. **\$29.95 \$26.95****Multimedia Authoring: Building and Developing Documents** by Scott Fisher addresses the concerns that face anyone trying to create multimedia documents. It offers specific advice on when to use different kinds of information architecture, discusses the human-factors concepts that determine how readers use and retain information, and then applies these findings to multimedia documents, covering the high-level issues concerning planners and authors of multimedia documents as well as those involved in evaluating or purchasing multimedia platforms. Includes one 3.5" high-density disk. **\$34.95 \$31.45****Multimedia Starter Kit for Macintosh** by Michael D. Murie. This hands-on book offers the latest and greatest in multimedia for the Mac!

Readers learn how to design their own multimedia projects step by step, then try it themselves with the demos, graphics, clips, and sample projects on the CD-ROM! CD-ROM contains QuickTime, sound and graphics clips and utilities, sample projects, and more. How to choose and use a variety of Macintosh multimedia tools and presentation environments. Includes demos of Adobe Illustrator, Premiere, Heizer Software programs, and more **\$39.95 \$27.00**

**QuickTime Starter Kit for Macintosh** by Robert A. Lettieri & Judith Stern. This is the ultimate package for getting productive and having fun with Macintosh movie-making. Easy steps and valuable software help readers play, make, and edit QuickTime movies. CD-

ROM includes QuickTime tools, movie clips, shareware, and demos of Premiere and other programs. Written by members of the respected Berkeley Macintosh User Group. Tips on the best ways to bring live-action video to Mac multimedia **\$45.00 \$40.50**

**3-D Starter Kit for Macintosh** by Sean Wagstaff. The complete reference to 3-D graphics on the Macintosh — ideal for beginning to intermediate product designers, illustrators, graphic designers, multimedia developers, animators, and video producers, as well as architects and engineers! Covers more than 50 major Macintosh 3-D imaging software packages — the most comprehensive book available. Lots of idea-packed examples that illustrate how 3-D products work — individually and together. CD-ROM includes sample models, image galleries, backgrounds, and textures, plus 3-D software tryout versions **\$40.00 \$36.00**

**The Instant Internet Guide** by Brent Heslop and David Angell. An Internet jump-start — how to access, use and navigate global networks. The Instant Internet Guide equips readers with the tools needed to travel the electronic world. The book highlights the most important sources of Internet news and information and explains how to access information on remote systems. It outlines how to use essential Internet utilities and programs and includes a primer on UNIX for the Internet. 224 pages **\$14.95 \$13.45**

**Internet Power Tools** by John Ross is designed for intermediate PC users, Internet Power Tools is a complete book/disk package that allows access to the world's largest network — the Internet — with the same ease as one uses Windows. The detailed instructions allow readers to find their way around the Internet fast and covers e-mail, file transfers, remote logon, on-line directories, and more. The accompanying disk is packed with powerful utilities, including Cello, PC Eudora, and Panda — easy-to-use graphical user interfaces (GUI) that obviate the need for the obscure Unix line commands that everyone else must learn. It also provides access to even more software via Random House's Internet FTP site and shows how to connect to the Internet via a network connection or dial-in. **\$40.00 \$36.00**

**Web Head; The Mac Guide to the World Wide Web** by Mary Jane Mara. Published by PeachPit Press. This is a beginning to intermediate book that shows you how to get the most from the Web, using plain talk that beginners will understand, and online veterans will appreciate. Web Head also includes in-depth tours of the three leading Web browsers for the Macintosh: Netscape, MacWeb, and MacMosaic, and explains the basics behind all Web browsers — so you will be ready even when the next hot Web browser hits the

## BOOKS ETC.

scene. It will also tell you how to get connected to the Web, finding your way across webspace, fine-tuning your Mac for top Web performance, and how to turn your Mac into a multimedia Web browser. There is also instruction on how to build your own home page, posting pages on the Web, and avoiding common HTML mistakes. \$24.95 \$22.45

### The Underground Guide to Telecommuting NEW!

Leonhard, Addison Wesley. There's no place like home. Especially when your boss, your kid, and the neighbor's dog are all barking for your attention simultaneously. Working away from a corporate office presents great (often unexpected) challenges and offers even greater rewards. Woody Leonhard takes on the toughest aspects of telecommuting and gives you the straight scoop on how to make it work for you. Whether you're a telecommuter, a telecommuter's boss, or just curious, *The Underground Guide to Telecommuting* will give you the tools and information you need to turn electricity and a phone line into major productivity. \$24.95 \$22.45

**The Elements of E-Mail Style** by Brent Heslop and David Angell. Learn the rules of the road in the e-mail age. Concise, easy-to-use format explaining essential e-mail guidelines and rules. It covers style, tone, typography, formatting, politics and etiquette. It also outlines basic rules of composition within the special context of writing e-mail and includes samples and templates for writing specific types of e-mail correspondence. 208 pages. \$14.95 \$13.45

**E-Mail Essentials** by Ed Tittel & Margaret Robbins is a hands-on guide to the basics of e-mail, the ubiquitous networks communication system. The book is suitable for both the casual e-mailer and the networking professional, as it covers everything from the installation of e-mail to the maintenance and management of e-mail hubs and message servers. The book explains the fundamental concepts and technologies of electronic mail, featuring chapters on Lotus applications and CompuServe, as well as information on upgrading, automation, message-based applications, and user training. *E-mail Essentials* is a

step-by-step, jargon-free guide that will enable the e-mail user to get the most out of the communication potentials of networking. 250 pp. \$24.95 \$22.45

### The Computer Privacy Handbook HOT ITEM!

**The Computer Privacy Handbook** is a practical guide to e-mail encryption, data protection, and PGP privacy software. With millions of e-mail messages and on-line discussions exchanged daily on the Internet, electronic security has become a key concern. *The Computer Privacy Handbook* explains practical steps individuals can take to safeguard their electronic security. It also gives a vivid description of how the "Surveillance Age" threatens each person's personal security, a non-technical introduction into data encryption, and the U.S. Government's Clipper Chip surveillance proposal. It also provides an overview of PGP, (Pretty Good Privacy), the world standard for e-mail privacy. \$24.95 \$22.45

**PowerPC System Architecture** by MindShare. NEW!

This book describes the hardware architecture of PowerPC systems, providing a clear, concise explanation of the PowerPC specification, the template upon which all PowerPC processors are designed. The author provides a complete description of the specification for both the 32- and 64-bit implementations. 656 pages \$24.95 \$31.46

### PCI System Architecture, Third Edition NEW!

Describing revision 2.1 of the Peripheral Component Interconnect (PCI) bus specification, this book explores PCI's relationship to the rest of the system. It includes an in-depth treatment of PCI to PCI bridges, the PCI BIOS, the 66MHz PCI bus, and more. 592 pages. \$34.95 \$31.46

### Cyberpunk Handbook, The Real Cyberpunk NEW!

**Fakebook** by St. Jude, R.U.Sirius, and Bart Nagel. Published by Random House. This book tells how to tell if you or someone you know is a Cyberpunk. \$19.95 \$8.95

## THE APPLE LIBRARY

**Learn C on Late Night NEW!**  
**With MacHack** covers the MacHack conferences from their inception in 1986, up to 1993. Doug Houseman is the program Chairperson of MacHack, and the author of this book. The accompanying CD contains over 100 of the best hacks written at MacHack over the years, including The Grouch, NetBunny, Jurassicon Park, DropSave, QuickTime Balloon Help, the Mac Clapper, Wavy, and more... \$20.95 \$26.95

**Advanced Color Imaging NEW!**  
**On the Mac OS** explains how you can augment the color support supplied with Quickdraw, and QuickdrawGX, using the Palette manager to provide the best set of colors on displays with limited color capabilities, soliciting the color choices from users with the color Picker Manager/ Using the ColorSync manager to match colors between screens and input and output devices such as scanners and printers/ learning how the color Manager assists Color QuickDraw in mapping an applications color requests to the actual colors available. \$36.95 \$33.25

**3D Graphics Programming Using QuickDraw 3D NEW!**  
by Apple Computer, Inc. Now you can incorporate spectacular 3D graphics into your applications. This book/CD-ROM package explores QuickDraw 3D, a graphics extension to the Mac OS for Power Macintoshes. The CD contains the complete QuickDraw 3D system itself and

a complete database of the QuickDraw 3D API, allowing you instant access to the hundreds of graphics calls via a fast viewing engine. Book/CD-ROM, 640 pages. \$39.95 \$35.96

**Tricks of The Mac Game Programming Gurus:** See page 68

**Apple Guide Complete** by NEW! Apple Computer, Inc. For those who want the full power of Apple's complete toolset, this book and CD-ROM package from Apple provides everything you need to produce guide files successfully, including Guide Maker, the software you use to build and test guide files. You'll learn about the complete cycle of designing as well as advanced topics such as scripting and coding guide files. Book/CD-ROM, 544 pages. \$39.95 \$35.96

**Inside AppleTalk** by Gursharan S. Sidhu, Richard F. Andrews and Alan B. Oppenheimer. Apple Computer, Inc. 650 pages. \$34.95 \$31.45

**AppleScript Finder Guide**, English Dialect, by Apple Computer, Inc. The AppleScript Finder Guide is an essential reference for anyone who wants to use AppleScript on a Mac to modify existing Finder scripts or to write new ones. The Finder scripting software allows you to write, record, or run scripts that trigger the same desktop actions that you trigger using the keyboard and mouse- actions such as opening and

closing folders or manipulating files. This book introduces Finder scripting and describes how to record and modify simple scripts. In particular, it provides definitions for Finder object classes and commands. Use of this book requires that AppleScript be installed, and you should be familiar with AppleScript Scripting Additions Guide, and AppleScript Language Guide. \$19.95 \$17.95

### AppleScript Language Guide HOT ITEM!

**AppleScript Language Guide**, by Apple Computer, Inc. The AppleScript Language Guide is the definitive description of the English dialect of the AppleScript scripting language. Scripting additions are files that extend AppleScript's capabilities by providing the additional commands or coercions for use in scripts. This book is an essential reference for anyone using AppleScript to modify existing scripts or to write new ones. It also contains useful information for programmers who are working on scriptable applications or complex scripts. This book begins with an introduction to scripting and an overview of AppleScript's main features. Most of the book consists of detailed definitions of AppleScript terminology and syntax in the following categories: Value classes, commands, objects and references to objects, expressions, control statements, handlers, and script objects. In addition to definitions the book provides many sample scripts and discusses advanced topics such as writing command handlers for script applications, the scope of script variables and properties declared at different levels in a script, and inheritance and delegation among script objects. To

get the most out of this book, you only need to be familiar with Macintosh computers. Although not required some previous experience with another scripting language (such as HyperTalk) is also helpful. \$29.95 \$26.95

### AppleScript Scripting Additions Guide, by HOT ITEM!

Apple Computer, Inc. AppleScript Scripting Additions Guide is the definitive description of the scripting additions that accompany the English dialect of the AppleScript scripting language. Scripting additions are files that extend AppleScript's capabilities by providing the additional commands or coercions for use in scripts. This book is an essential reference for anyone using AppleScript to modify existing scripts or write new ones. It also contains information for programmers who want to write scripting additions. The Scripting Additions Guide is also a how to install any scripting additions and invoke their commands, to use the standard scripting additions commands, or to write scripting additions. \$19.95 \$17.95

**HyperCard Stack Design Guidelines** by Apple Computer, Inc. is an essential book for everyone who creates Apple HyperCard stacks, from beginners to commercial developers. It covers the basic principles of design that, when incorporated, make HyperCard stacks effective and usable. Topics include guidelines, navigation, graphic design

**THE APPLE LIBRARY**

and screen illustration, text in stacks, music and sound, a sample stack development scenario, collaborative development, and the Stack Design Checklist. 240 pages. \$21.95 **\$19.95**

**Macintosh Programmer's Toolbox Assistant CD-ROM:** See page 101

**Inside Macintosh®: CD-ROM:** See page 102

**Inside Macintosh®: Overview** by Apple Computer, Inc. is the first book that people who are unfamiliar with Macintosh programming should read. It gives an overview of Macintosh programming fundamentals and a road map to the New Inside Macintosh library. Inside Macintosh Overview also covers various programming tools and languages, compatibility guidelines and an overview of considerations for worldwide development. 176 pages. \$40.45 **\$36.40**

**Inside Macintosh®: Files** by Apple Computer, Inc. describes the parts of the operating system that allow you to manage files. It shows how your application can handle the commands typically found in a File menu. It also provides a reference to the File and Alias Managers, the Disk Initialization and Standard File Packages. 510 pgs. \$29.95 **\$26.95**

**Inside Macintosh®: Operating System Utilities** by Apple Computer, Inc. describes parts of the Macintosh Operating System that allow you to manage various low-level aspects of the operating system. Everyone who programs the Macintosh should read this book! It will show you in detail how to get information about the operating system, manage operating system queues, handle dates and times, control the settings of the parameter RAM, manipulate the trap dispatch table, and receive and respond to low-level system errors. \$26.05 **\$23.45**

**Inside Macintosh®: Processes** by Apple Computer, Inc. describes the parts of the Macintosh operating system that allow you to control the execution of processes and interrupt tasks. It shows in detail how you can use the Process Manager to get information about processes loaded in memory. It is also a reference for the Vertical Retrace, Time, Notification, Deferred Task, and Shutdown Managers. 208 pages. \$22.95 **\$20.65**

**Inside Macintosh®: Memory** by Apple Computer, Inc. describes the parts of the Macintosh operating system that allow you to manage memory. It provides detailed strategies for allocating and releasing memory, avoiding low-memory situations, reference to the Memory Manager, the Virtual Memory Manager, and memory-related utilities. 296 pages. \$24.95 **\$22.45**

**Inside Macintosh®: AOCe Application Interfaces** by Apple

Computer, Inc. shows how your application can take advantage of the system software features provided by PowerTalk system software and the PowerShare collaboration servers. Nearly every Macintosh application program can benefit from the addition of some of these features. This book shows how you can add electronic mail capabilities to your application, write a messaging application or agent, store information in and retrieve information from PowerShare and other AOCe catalogs, add catalog-browsing and find-in-catalog capabilities to your application, write templates that extend the Finder's ability to display information in PowerShare and other AOCe catalogs, add digital signatures to files or to any portion of a document, and establish an authenticated messaging connection. \$40.45 **\$36.40**

**Inside Macintosh®: AOCe Service Access Modules** by Apple Computer, Inc. describes how to write a software module that gives users and PowerTalk-enabled applications access to a new or existing mail and messaging service or catalog service. This book shows how to write a catalog service access module (CSAM), a messaging service access module (MSAM), and AOCe templates that allow a user to set up a CSAM or MSAM and add addresses to mail and messages. \$26.05 **\$24.25**

**Inside Macintosh®: Devices** by Apple Computer, Inc. describes how to write software that interacts with built-in and peripheral hardware devices. With this book, you'll learn how to write and install your own device drivers, desk accessories, and Chooser extensions; communicate with device drivers using the Device Manager; access expansion cards using the Slot Manager; control SCSI devices using SCSI Manager 4.3 or the original SCSI Manager; communicate directly with Apple Desktop Bus devices; interact with the Power Manager in battery-powered Macintosh computers; and communicate with serial devices using the Serial Driver. \$29.95 **\$26.95**

**Inside Macintosh®: Macintosh Toolbox Essentials** by Apple Computer, Inc. covers the heart of the Macintosh. The toolbox enables programmers to create applications consistent with the Macintosh "look and feel". This book describes Toolbox routines and shows how to implement essential user interface elements, such as menus, windows, scroll bars, icons and dialog boxes. 880 pages. \$34.95 **\$31.45**

**Inside Macintosh®: More Macintosh Toolbox** by Apple Computer, Inc. covers other Macintosh features such as how to support copy and paste, provide Balloon Help, play and record sound and create control panels are covered in this volume. The managers discussed include Help, List, Resource, Scrap and Sound. \$34.65 **\$31.45**

**Inside Macintosh®: Networking** by Apple Computer, Inc. describes how to write software that uses AppleTalk networking protocols. It describes the components and organization of AppleTalk and how to select an AppleTalk protocol. It provides the complete application interfaces to all AppleTalk protocols, including ATP (AppleTalk Transaction Protocol), DDP (Datagram Delivery Protocol), and ADSP (AppleTalk Data Stream Protocol), among others. \$29.95 **\$26.95**

**Inside Macintosh®: Interapplication Communication** by Apple Computer, Inc. shows how applications can work together. How your application can share data, request information or services, allow the user to automate tasks, communicate with remote databases. \$34.95 **\$31.45**

**Inside Macintosh®: PowerPC Numerics** by Apple Computer, Inc. describes the floating-point numerics environment provided with the first release of PowerPC processor-based Macintosh computers. The numerics environment conforms to the IEEE standard 754 for binary floating-point arithmetic. This book provides a description of that standard and shows how RISC Numerics compiles with it. This book also shows programmers how to create floating-point values and how to perform operations on floating-point values in high-level languages such as C and in PowerPC assembly language. \$28.95 **\$26.00**

**Inside Macintosh®: PowerPC System Software** by Apple Computer, Inc. describes the new process execution environment and system software services provided with the first version of the system software for Macintosh on PowerPC computers. It contains information you need to know to write applications and other software that can run on the PowerPC. PowerPC System Software shows in detail how to make your software compatible with the new run-time environment provided on PowerPC-based Macintosh computers. It also provides a complete technical reference for the Mixed Mode Manager, the Code Fragment Manager, and the Exception Manager. \$24.95 **\$22.45**

**Inside Macintosh®: Sound** by Apple Computer, Inc. describes the parts of the Macintosh system software that allow you to manage sounds. It contains information that you need to know to write applications and other software that can record and play back sounds, compress and expand audio data, convert text to speech, and perform other similar operations. \$26.95 **\$24.25**

**Inside Macintosh®: Text** by Apple Computer, Inc. describes how to perform text handling, from simple character display to multi-language processing. The

Font, Script, Text Services, and Dictionary Managers are all covered, in addition to QuickDraw Text, TextEdit, and International and Keyboard Resources. \$29.95 **\$35.95**

**Inside Macintosh®: Imaging** by Apple Computer, Inc. covers QuickDraw and Color QuickDraw. The book includes general discussions of drawing and working with color. It describes the structures that hold images and image information, and the routines that manipulate them. It also covers the Palette, Color, and Printing Managers, and the Color Picker, Color Matching, and Picture Utilities. \$26.95 **\$24.25**

**Inside Macintosh®: QuickDraw™ GX Graphics** by Apple Computer, Inc. shows readers how to create and manipulate the fundamental geometric shapes of QuickDraw GX to generate a vast range of graphic entities. It also demonstrates how to work with bitmaps and pictures, and specialized QuickDraw GX graphic shapes. \$26.95 **\$24.25**

**Inside Macintosh®: QuickDraw™ GX Objects** by Apple Computer, Inc. introduces QuickDraw GX and its object structure, and shows programmers how to manipulate objects in all types of programs. \$26.95 **\$24.25**

**Inside Macintosh®: QuickDraw™ GX Environment and Utilities** — A companion to QuickDraw™ GX Objects, this book contains programming information useful to any developer writing QuickDraw GX applications. It describes QuickDraw GX memory management, error handling, debugging, and mathematical functions, as well as conversion from QuickDraw to QuickDraw GX. \$29.95 **\$26.95**

**Inside Macintosh®: QuickDraw™ GX Library** by Apple Computer, Inc. is the powerful new graphics architecture for the Macintosh. Far more than just a revision of QuickDraw, QuickDraw GX is a unified approach to graphics and typography that gives programmers unprecedented flexibility and power in drawing and printing all kinds of shapes, images, and text.

**Inside Macintosh®: QuickDraw™ GX Printing** This book is essential for any developer whose QuickDraw™ GX application supports printing. It shows how to support the new printing features of QuickDraw GX, including desktop printers and expandable printing dialog boxes. QuickDraw GX Printing also shows how to use printing-related objects to add custom panels to printing dialog boxes and to create custom page formats. \$26.95 **\$24.25**

**Inside Macintosh®: QuickDraw™ GX Printing Extensions and Drivers** — Any developer who wants to create extensions to the application

## THE APPLE LIBRARY

printing capabilities of QuickDraw™ GX, or who needs to write a printing device driver that works with QuickDraw GX needs this book. QuickDraw GX Printing Extensions and Drivers describes how to create printing extensions and printer drivers, and provides a complete reference to the messages, functions, and resources that they use. \$20.95 \$26.95

**Inside Macintosh®: QuickDraw™ GX Programmer's Overview** — This book provides an introduction to QuickDraw™ GX, providing an overview of the QuickDraw GX environment from a developer's perspective. It introduces the QuickDraw™ GX programming and runtime environments, the relationship between QuickDraw GX and the rest of the Macintosh® systems software and the relationship between QuickDraw GX and Macintosh applications. The key elements of QuickDraw GX programming, data

structures, object types, and functions used most frequently by QuickDraw GX developers are also covered. After a general introduction, this book provides readers with a series of practical examples demonstrating how to approach programming with QuickDraw GX. \$24.95 \$22.45

**Inside Macintosh®: QuickDraw™ GX Typography** — This book is essential for any developer who uses QuickDraw™ GX to manipulate text. It shows how to use QuickDraw GX objects to handle all kinds of text — from plain, unstyled text to complex, mixed-direction and multi-language text with sophisticated stylistic and typographic variations. QuickDraw GX Typography shows how to create and manipulate the three different types of text shapes supported by QuickDraw GX including text shapes, glyph shapes, and layout shapes. \$20.95 \$26.95

**Inside Macintosh®: QuickTime** by Apple Computer, Inc. is for anyone who wants to create applications that use QuickTime, the system software that allows the integration of video, animation, and sounds into applications. This book describes all of the QuickTime Toolbox utilities. In addition, it provides the information you need to compress and decompress images and image sequences. \$20.95 \$26.95

**Inside Macintosh®: QuickTime Components** by Apple Computer, Inc. covers how to use and develop QuickTime components such as image compressors, movie controllers, sequence grabbers, and video digitizers. \$34.95 \$31.45

**Inside Macintosh®: X-Ref** by Apple Computer, Inc. is a fast access to all the information in Inside Macintosh. Inside

Macintosh X Ref; Provides programmers with a quick and easy way to find the exact information they need in this definitive suite of books, (all 26 volumes). It is indexed by topic, volume, chapter, and accompanying page number. \$10.95 \$17.95.

**Inside the Macintosh Communications ToolBox** by Apple Computer. This book is the definitive reference to the Macintosh Communications Toolbox, an integral part of the System 7 Macintosh Toolbox that enables developers to create communications applications or add communications features to other applications. This book describes all of the routines that provide programmers with standard access to important communications services and in addition enables programmers to extend the reach of the Macintosh into non-Apple environments. \$24.95 \$22.45.

## EDITORS/DEVELOPMENT ENVIRONMENTS & LANGUAGES

**BBEdit 3.1:** See page 101

**CMaster 2.0** by Jersey Scientific installs into THINK C 5 / 6 / 7 and Symantec C++ for Macintosh, and enhances the editor. Use its function popup to select a function and CMaster takes you right to it. Other features include multiple clipboards and markers, a Function Prototyper, and a GoBack Menu which can take you back to previous editing contexts. Almost all features bindable to the keyboard, along over a hundred keyboard-only features like "Add New Automatic Variable." Glossaries, AppleScript and ToolServer support, Macros, and External Tools you create too! \$129.95

**QUED/M 2.7** by Nisus Software, is a programmer's text editor which has defined the industry standard for speed and efficiency. With integrated support for Symantec C/C++, Metrowerks CodeWarrior 6, and MPW, QUED/M offers unrivaled usefulness for the Macintosh developer. In addition to supporting all the major development environments on the Macintosh, QUED/M offers dozens of powerful editing features, including unlimited undo and redo, UNIX style GREP searching, macro language, scripting, text folding, text sorting, file comparison and merging, Toolbox lookup, ten editable/appendable clipboards, line numbering, markers, displaying text as ASCII codes, vertical and horizontal screen splitting, plus much more. \$149.

**CodeManager™ Microsoft® Visual SourceSafe™ 4.0 compatible** source code control system for the Macintosh® \$399. Call for more info.

**CodeWarrior™ 8 CD** by Metrowerks comes in two versions — Bronze and Gold. These CDs



contain the CodeWarrior 7 development environment including C++, C and Pascal compilers; high-speed linkers; native-mode interactive debuggers; and a powerful new application framework called PowerPlant for rapid Macintosh development in C++. Bronze generates 680x0 code. Gold generates both 680x0 and PowerPC code. Comes in two versions — Bronze and Gold. New to these versions is an Integrated Class Browser, Faster code, Better Code Generation for PowerPC. Updated OpenDoc™ support. New Networking Classes in PowerPlant, New Editor Functions. Zero Overhead Exceptions for C++. Libraries for the new Be Operating System. CodeWarrior 8 Gold. With CodeWarrior's plug in architecture, choose your target platform from within one Integrated Development Environment. Gold supports the following platforms: PowerPC™, Mac™OS, PowerTV™, Be™OS for BeBox™, 68K: Mac™OS, Magic Cap™, x86: Windows 95™, Windows NT™. It includes C/C++ and Object Pascal. CodeWarrior 8 Bronze. Macintosh programming solution that generates code that runs native on 68K and runs emulated on PowerPC. Supports C/C++ and Object Pascal. Gold \$399. Includes a 1 year MacTech subscription. Bronze \$149. Includes a 6-month subscription.

**SYMANTEC.™**

**Symantec C++** See page 101

**THINK Pascal v. 4.0** by Symantec Corporation. Professionals and students will welcome this version of THINK Pascal. It is fully integrated for rapid turnaround time and lets you take advantage of System 7 capabilities. Features include support for

large projects, enhanced THINK Class Library, System 7 compatibility, superior code generation, and smart linking. Product Contents: Four Macintosh disks, a 562-page user manual, and a 498-page object-oriented programming manual. \$169

**LS Object Pascal CD** includes the world's first Object Pascal compiler for Power Macintosh. 100% compatible with Apple's MPW Pascal, LS Object Pascal combines the best of Apple's native development tools with innovative new technology developed at Language Systems. Compiler options specify 68K or native PowerPC code generation. Included on the CD are: LS Object Pascal compiler, Universal Pascal Toolbox interfaces, fully loaded MPW 3.3.1, 68K and PowerPC source debuggers, PowerPC assembler, online documentation, Macintosh Tech Notes, and a special version of AppMaker by Bowers Development that generates native Pascal source code. The beta release includes upgrades to v1.0 when it becomes available. \$399

**LPA MacProlog** comprises a Edinburgh syntax Prolog compiler system set in an attractive multi-window development environment with an integrated program editor, graphical call-graph facilities and an interactive source-level debugger. LPA MacProlog features high-level access to the Macintosh Toolbox for using graphics, dialogs, windows, icons, resources in a simple and versatile way. LPA MacProlog also includes interfaces to C and Pascal code resources. The MacProlog Run-time Generator enables the production of double-clickable distributable applications. The compact run-time system supports first argument indexing, tail-recursion and last-call optimization. Optional add-ons tools include flex, Prolog++, MacDBI for Oracle

and the MacProlog Dialog Editor. Programmer Edition \$745; Developer Edition (which includes the run-time generator and distribution license) \$1500

**SmallTalkAgents® (STA)** is a sophisticated application development environment

 featuring a new generation of the Smalltalk language, QKS Smalltalk™. Productivity is no longer measured in lines of code, but in project completion time. STA allows "live" direct manipulation of your objects. The development process is dynamic, interactive and iterative. Just like C/C++ and Assembly, STA provides easy and full access to the features of the MacOSTM and Mac Toolbox. You can link your non-Smalltalk code resources using our External Code Linking Toolkit™ (ECLT). You can also call back into STA from foreign functions written in C/C++, Pascal, FORTRAN, and Assembly. STA's automatic garbage collection and object-based typing will free you from tedious memory management and bookkeeping chores. A sophisticated database for source code management provides an almost infinite variety of ways to cross-reference, access, view, and manipulate your code and objects. STA includes an Application Delivery Toolkit™ (ADT) that allows you to create royalty-free, stand-alone, double-clickable applications in just a matter of minutes. The foundation of the QKS Product Family, the Agents Object System (AO/S), is an underlying task framework, housing components and services that save you years of work. Any component built in AO/S will function as an OpenDoc component or container and components from non-AO/S sources can be seamlessly integrated into the AO/S system. SmallTalkAgents List Price: \$695.

**SOFTWARE ENGINEERING/PROFILERS/DEBUGGERS INSTALLER  
TOOLS/LIBRARIES/Frameworks/DATABASES****SOFTWARE  
ENGINEERING**

**ICONIX PowerTools** by  ICONIX has been a leading supplier of CASE tools, since 1984. One of the first Object-Oriented CASE tool developers, ICONIX is known throughout the industry for producing affordable, high-quality tools and state-of-the-art training. Our line of Object-Oriented Analysis and Design tools, ICONIX PowerTools, is an integrated set of 10 CASE tools supporting the major phases of the system development life cycle and automating analysis, design, coding, and the management of complex systems. ICONIX is unique because we are the first to bundle CASE tools, CD-ROM training, and on-site training and consulting. Each individual module is \$1,495. PowerPack Bundles: Choose any 6, 8 or 10 distinct modules of your choice to customize your own ICONIX PowerTools toolset. Our professional sales staff will gladly assist you in choosing the right tools for your project's needs. PowerPack/6: \$5,995 PowerPack/8: \$6,995 PowerPack/10: \$7,995. (Full Product Line) Call for pricing on Upgrade Service & Training and Consulting.

**Voodoo** is a version control tool for the simple and clear management of projects in which files are created in numerous versions (variants and revisions). Voodoo allows both variant and revision control, and it manages not only variants and revisions of single files, but of a whole software project (multi files, multi users, multi variants, access rights, ...). The tool offers a neat graphical user interface and is not only suitable for mere source code control but can handle all different kinds of files with amazing compression rates:

**HOT ITEM!** typical size of delta between arbitrary files 5% (in words: five per cent)!!! no matter whether the files are plain text or any other documents – e.g., MSWord, 4D, Canvas, FileMaker ... Please note special prices for multiple copies: single license \$190; 2 pack \$300; 5 pack \$665; 10 pack \$1140; 20 pack \$2000. Add'l pricing available on request.

**PROFILERS/  
DEBUGGERS**

**LJ Profiler** by Lars Jordbo Datakonsult supports profiling of C++ 68K and PowerPC applications compiled with CodeWarrior 6, CFront or Symantec C++. Based on active profiling, i.e. profiling code called at function enter and exit, the browser application lets you

follow call chain timings in hierarchical views or separate windows. Collect, organize, compare and save profiling data from different versions of your application into a project. Scriptable and recordable with full access to most internal data structures. Optional remote profiling and tracking of segment and stack usage. Full source code to what you link into your application. \$295.

**Last Resort Programmer's Edition** records every keystroke, command key and mouse event (in local coordinates) to a file on your hard disk. This is especially useful for program testing & debugging, and for technical support and help desks. If something goes wrong (because of a power failure, system crash, forgetting to save or deleting lines) and you lose a word, phrase, or document you can look in the Last Resort keystroke file and recover what you typed. Last Resort is also useful for technical support personnel, when they have to ask "What was the last thing you did before..."? \$74.95

**QC™** by Onyx Technology. See page 69  
**The Memory Mine™** by Adianta is a stand alone debugging tool for Macintosh and native PowerPC. Programmers can monitor heaps, identify problems such as memory leaks, and stress test applications. Active status of memory in a heap is sampled on the fly: allocation in non-relocatable (Ptr), relocatable (Handle) and free space is shown, as are heap corruption, fragmentation, and more... Allocate, Purge, Compact, and Zap memory let users stress test all or part of a program. Source code is not needed to view heaps. It works on Macintoshes with 68020 or later and System 7.0 or later. \$99

**Spyer** by InCider is a simple operated tool that records all actions (including mouse movement) you perform on a Macintosh computer and then replays them at your preferred speed. The recorded data can be saved in files for future use. Spyer works as a background process with any Macintosh application and is triggered by user defined Hot Keys. Spyer enables the "Continuous Redo" utility and is especially useful for software testing and demonstration. \$39

**INSTALLER TOOLS**

**InstallerPack™** by StepUp Software is a package of several Installer "atoms" that let developers incorporate graphics, sounds, file compression and custom folder icons into installation scripts. Compression formats supported are Compact Pro & Diamond. Each atom also available separately. Compression

requires additional licensing. \$219

**ScriptGen Pro™** by StepUp Software is an Installer script generator which requires no programming or knowledge of Rez. Supports StepUp's InstallerPack, StuffIt compression, custom packages, splash screens, network installs, Rez code output, importing resources, and AppleEvent link w/MPW: \$169

**LIBRARIES/  
FRAMEWORKS/  
DATABASES**

**OOFILE** See page 100

**PowerTap™** See page 100

**3D Game Machine v1.2** by Virtually Unlimited is a C library for creating lightning-fast 3D arcade games and interactive multimedia applications. 3DM has a simple easy-to-use interface and features very fast rendering (15 frames per second on a 14" monitor completely texture-mapped, with a PowerMac 6100/60), full "virtual" 3D worlds with six degrees of freedom, free-form texture mapping, shading, material and light properties, convex/cave polygons with unlimited vertices, unlimited light sources, dynamic hidden surface removal, special graphic modes for fast full-screen animation, collision detection, explosion simulation, 3D data importing. Runs on all Macs! Works with CodeWarrior. \$299 + license.

**Animation Class Library version 2.0** (ACL2.0) is an advanced object-oriented multimedia framework, allowing fast development of high-quality interactive applications. Main features of ACL2.0 are: Powerful animation engine which supports structured sprites, collision detection at pixel precision, sprites sorting, powerful blitter and vector objects. Scrolling of background picture in circular buffer and tile-mapscrolling. Application framework for building standard and 3D controls, panes, menus, full screen displays, windows, etc. Quicktime and multi-channel sound support. >800 functions and >100'000 lines. Complete C++ source code for CodeWarrior and Symantec C++, examples, documentation and technical support. \$250

**dtF** is a true relational database system for Apple Macintosh computers. dtF provides a powerful choice for developers who want to create database centered applications with no performance trade-offs. dtF features SQL, full transaction control, error recovery, single user, client server architecture and multi-platform support including DOS, Windows, OS/2 and UNIX. The C/C++ API is identical and

fully portable cross all supported platforms. Third-party vendors supporting dtF will be able to offer a variety of advanced features and benefits to their customers royalty free. Tools are included for importing, exporting, creating and managing databases and users. Supported development environments include: Symantec, MPW, Metrowerks and more. Mac/SDK \$695

**MacWireFrame** by Amplified Intelligence. Create your own virtual reality application with MacWireFrame, a virtual reality application frame work. Includes a complete library of object oriented graphics routines, its own easy to understand application frame work (similar to MacApp or TCL but a lot easier to understand), plus an example application program that lets you start solid modeling right away. Comes complete with fully documented source code. All new purchases will be guaranteed a \$49.99 upgrade to the soon to be released, scriptable, MacWireFrame 5.0. Due to the overwhelming response the special price offer has been extended for a little while longer. **Special Offer: \$299.00 \$75!!!!**



**PictureCDEF 1.3** by Paradigm Software is a professional-level CDEF for creating custom graphical buttons (8-64 pixels). PictureCDEF is used in products by

Adobe, ProVue, STF Technologies and others. It is multi-monitor and bit-depth sensitive. The button graphic (cicn, ResEdit) can be changed at runtime and even animated with a call-back routine. Create distinct buttons in seven variations: MultiState, PushButton, FlexiButton, ToggleButton, ChkButton, PushPictButton and TogglePictButton. Position the optional button title at left, bottom or right, or follow the system text direction for international support. Manual, sample code and MacApp 3.0 support included. Full source code: \$95.00 Object code: \$45.00.

**Q3S/3dPane/SmartPane** source code bundle by Vivistar Consulting. Q3S: source code bundle from ViviStar Consulting. Full featured 3d graphics. Points; lines; polygons; polyhedra; Gouraud shading; z-buffering; culling; depth cueing; parallel, perspective, and stereoscopic projections; performance enhancing "OnlyQD" and "Wireframe" modes; full clipping; pipeline access; animation and model interaction support; and a "triad mouse" to map 2d mouse movement to 3d. **3dPane** provides integration with the TCL and provides a view orientation controller. **SmartPane**

## SOFTWARE ENGINEERING/PROFILERS/DEBUGGERS INSTALLER TOOLS/LIBRARIES/FRAMEWORKS/DATABASES

provides TCL offscreen image buffering, flicker free animation, and QuickTime movie recording. SmartPan functions in 3d or 2d scenarios. All work with C++ compilers or ThinkC 6 and compile to PowerPC or 68K target machines. \$192

**Spellswell 7 1.0.4** is an award-winning, comprehensive, practical spelling checker that works in batch mode or within applications that incorporate the Apple Events Word Services protocol (e.g., Eudora, WordPerfect, Communicate!, and Fair Witness). Spellswell 7 checks for spelling errors as well as common typos like capitalization errors, spaces before punctuation, double double word errors, abbreviation errors, mixed case errors, extra spaces between words, a/an before vowel/consonant, etc... MacTech orders include developer kit with Writewell Jr., a sample Apple Events Word Services word-processor and its source code. \$74.95

**StoneTable Extra:** Additional functions for StoneTable. Drag selected cells within table or to other tables; optionally add rows as part of drag; popup menus or check boxes in cells; variable width grid lines; move/drag/resize table in window; clipboard operations on multiple cells. Requires StoneTable. (all prices per developer) \$50 first compiler, additional compilers \$25.

**StoneTable:** A library replacing all functions found in list manager plus: variable size columns/rows; different font, size, style, forecolor, backcolor per cell; sort, resize, move, copy, hide columns/rows; edit cells/titles in place; titles for columns/rows; multiple lines per cell; grid line pattern/color; greater than 32k data per table; up to 32k text per cell; support for balloon help and binary cell data. Versions for Think C, Think Pascal, MPW C, MPW Pascal, CodeWarrior 6 C.

(all prices per developer) \$150 first compiler, additional compilers \$50.

**StoneTable and StoneTable-Extra for PowerPC:** Same functionality as 68K libraries. Versions for MPW C and CodeWarrior 6 C. Must have 68K libraries. (all prices per developer) StoneTable \$100, StoneTableExtra \$25.

**B-Tree HELPER™ 2.2** is an inexpensive database engine for Macintosh programmers in C source code. B-Tree HELPER gets space in a file in contiguous fixed length blocks. It expands the file as necessary and contracts files when possible. B-Tree HELPER inserts and deletes keys in one or more B-Trees. It finds keys equal to, less than, or greater than a given value in a few hundredths of a second. It finds lists of records whose keys are equal to, less than, or greater than a given value or

are in a range of values. \$150

**AppMaker** makes it faster and easier to develop the user interface for a Macintosh application. Just point and click to design your application, then AppMaker creates resources and generates excellent source code. AppMaker supports most development environments including Metrowerks, Symantec, or MPW; C, C++, or Pascal; procedural or object-oriented, using PowerPlant, TCL, or MacApp. The generated code uses the Universal Headers to provide PowerMac compatibility. Beginners use AppMaker to learn object-oriented and Macintosh Toolbox programming techniques. Experts use it to increase productivity. It saves so much time it's like having your own assistant programmer working for you. Includes one-year subscription on CD. \$299

## SCRIPTING/SYSTEM ADMINISTRATION

### SCRIPTING/ SYSTEM ADMINISTRATION

**ScriptWizard™** See page 102

**FaceSpan™ v2:** See page 101

**DataScript** DataScript is probably the quickest, easiest and most cost-effective way to make your integrated AppleScript solutions database aware today. **Quickest:** It takes just six lines of AppleScript to make new or existing scripted solutions database aware, and fetch data from RDBM's such as Oracle, Sybase, DB2, or Informix. **Easiest:** DataScript's scripting terminology is easy to learn, easy to use, and easy to remember. "Inside DataScript" contains lots of easy to follow scripts to reuse in your own solution. **Cost Effective:** Because DataScript is so easy to learn, and use you'll become productive very quickly, and once you're ready to ship, you'll find our licensing schemes very attractive. \$249.00

**Scripter®:** See page 101

**CLImate** by Orchard Software is a command line interface that lets you communicate with your Macintosh using English commands to create, delete, rename, and move files and folders. It can start applications, format disks, restart your computer, etc. CLImate supplements the Finder. It includes a BASIC interpreter that lets you script your Macintosh without AppleScript. The interpreter includes advanced programming constructs: repeat loops, if/then/else

conditionals, subroutine calls, etc... CLImate implements wildcard characters, enabling you to work on groups of files. Use CLImate instead of MPW to manage your projects. CLImate is an application occupying 70K disk space. It comes bundled with sample programs and full documentation. \$59.95

**Cron Manager** by Orchard Software implements the UNIX Cron facility. It can open any Macintosh file on a given date and time. By creating an alias, renaming it to the date and time to open, and moving it into the special Cron Events Folder, Cron Manager will open it. Cron Manager is a control panel that creates the special Cron Events Folder inside your System Folder. It is completely transparent to the user. It works like the Startup Items folder, only smarter. It works with any Macintosh file: if you can double-click to start it, Cron Manager can open it. \$26.95. Cron Manager bundled with CLImate, \$59.95.

**Rosanne™** Rosanne is a collection of utilities which offer the user complete control over raw data. Users can sort files, extract selected records, summarize frequency counts, create sample files, perform matching on multiple files, and reformat data to new specifications, all on the desktop, and even on files of a million records or more. The Rosanne Utilities also support AppleScript™, enabling the user to link several actions together to complete an entire process. The Rosanne Utilities are recordable; users may perform a series of actions, and using an AppleScript editor such as Scripter™, see their actions translated directly into AppleScript commands. All of the utilities support multi-tasking and background processing. The Rosanne Utilities will

assist you in picking your specifications, determining record length, creating output files and managing the storage of data. **Rosanne Utilities:** **Copy** – duplicates an input file. **Format** – creates an altered version of an input file, containing either subsets of the fields on the input file, or new fields. **Select** – creates a subset of the records on an input file based on some selection criteria. **The Recode** option allows the user to group data, or correct coding entries. **Sort** – orders an input file by a particular field or set of fields. **Match** – joins together two input files based on common values occurring in corresponding fields or sets of fields. **Aggregate** – creates an output file with summary levels. \$59.5

**ScriptBase™ The Scripting Database** is a database for storing persistent objects to be made available for access to AppleScript, Apple's system-level user scripting language for controlling applications on Macintosh computers. Once installed, the database becomes part of the AppleScript system, adding a host of commands to the basic AppleScript vocabulary. Retrieving the objects is simple using AppleScript's natural-language syntax and structure. Objects stored and retrieved in ScriptBase

can be accessible any time from any script on the user's computer. These objects can be of any type, including numbers, character strings, lists, records, scripts, and references to disks, files, folders, as well as abstract raw data, to name just a few. ScriptBase can be used to maintain system-wide settings, such as sets of preferences, paths to frequently-used files or folders. Complex installations can be made easier by organizing data and scripts within the database's structure. \$79

**Script Debugger** by Late Night Software Ltd. is a powerful and flexible AppleScript authoring tool. **HOT ITEM!** Script Debugger makes it simple for novice and experienced script writers to get the most from AppleScript. The program's advanced debugging environment offers single-step script execution with breakpoints. The Script Debugger dictionary browser features a graphical view of objects provided by scriptable applications. With the program, you also receive the Late Night Software Scripting Additions, a collection of more than 70 new AppleScript commands, and Scheduler, a utility that allows you to launch scripts at pre-determined times. \$129

## SOFTWARE FOR SALE?

List your product in MacTech Magazine's Mail Order Store.

For more information, call 805/494-9797.

Internet: [marketing@xplain.com](mailto:marketing@xplain.com)

## SCRIPTING/SYSTEM ADMINISTRATION



### TCP/IP Scripting Addition™

"TCP/IP Scripting Addition™" is the latest version of an award-winning AppleScript scripting addition (first place in the 1994 "Best Hack" category in the Everyday AppleScript™ Programming Competition). This scripting addition (or osax) allows you to write scripts using

MacTCP™ commands in AppleScript™. Potential uses of this include sending e-mail or files through a script, checking if users are logged on (via Finger), automating FTP, Gopher, NetNews, Telnet, and LPR, verifying links in HTML documents, and quickly writing many other TCP/IP client-server programs. Sample

scripts are included already implementing many of these functions. When combined with FaceSpan, the potential for rapid implementation of Internet client-server applications is enormous. The TCP/IP Scripting Addition works with AppleScript 1.0 or later and MacTCP 2.0.4 or later. It is compatible with Open Transport™. The

TCP/IP Scripting Addition can be used from Script Editor, HyperCard 2.2, MacPERL, FaceSpan and other Open Scripting Architecture applications. See "<http://www.mangotree.com/biz/mango/index.html>" for more details. \$49

## MACTECH EXCLUSIVES/MISCELLANEOUS

*MacTech Magazine is your exclusive source for these specific products including available back issues of SFA's magazine, source code disks and assorted cd's. Call for more info and pricing:*

**Ad Lib 2.0** The premier MacApp 3.0 compatible ViewEdit replacement. A powerful user-interface editing tool to build views for MacApp 3.0 and 3.1. Ad Lib allows subclassing of all of MacApp's view classes including adorners, behaviors, and drawing environments. String and text style resources are managed automatically. Alternate display methods, such as a view hierarchy window, allow easy examination of complex view structures. Ad Lib includes source code for MacApp extensions that are supported by the editor – buttons can be activated by keystrokes, behaviors can be attached to the application object, and general purpose behaviors can be configured to perform a number of useful functions. Run mode allows the user to try out the views as they will work in an application. Templates can be created to add additional data fields to view classes. Editing palettes provide fast and easy editing of common objects and attributes. Works with ACI's Object Master (version 2.0 and later) to navigate a project's user interface source code. \$195

**FrameWorks Magazine:** \$8/back-issue, subject to availability.

**FrameWorks Source Code Disk:** \$10 per back issue, subject to availability.

**Five Years of Objects CD-ROM:** FrameWorks archives and source code from April 1991 to January 1993, plus selected object-oriented publicly available software and demos. \$95

**MADACON '93 CD-ROM:** The highlights of MADACON '93, including Mike Potel on Pink, Bedrock, MacApp, OODLs, and more. Slides, articles, demos, audio, and QuickTime. \$95

**MASScript 1.2** adds support for AppleScript to your MacApp 3.0.1 and 3.1 based applications. Make your application scriptable and recordable by building on a tried and tested framework for object model support. MASScript dispatches Apple events to the appropriate objects, creates object specifiers, and makes

framework objects like windows and documents scriptable and recordable. Sample application shows you how to begin adding support for scripting and recording. MASScript includes complete source code. Install MASScript by modifying one MacApp source file, then adding another to your project. Future versions of MacApp will incorporate MASScript, so MASScript support you add now will work in the future. \$199

**The Mjølner BETA System** is a software development environment supporting object-oriented programming in the BETA programming language. BETA is uniquely expressive and orthogonal. BETA unifies just about every abstraction mechanism – including class, procedure, function, coroutine, process and exception – into the ultimate abstraction mechanism: the pattern. BETA includes: general block structure, strong typing, whole/part objects. The compiler: binary code generation, automatic garbage collection, separate compilation, interface to C, Pascal, and assembler. The system: persistent objects, basic libraries with containers classes, platform-independent GUI application frameworks on Unix, Mac and Windows NT, metaprogramming system. The tools available on Unix: the hyper structure editor supporting syntax directed editing, browsing, etc., and the source code debugger are currently being ported to the Macintosh system. The Mjølner BETA System for Macintosh requires MPW (basic set) 3.2 or later. Package containing compiler, basic libraries, persistent store, GUI framework, and comprehensive documentation. (Other packages are also available) \$295

**More Savvy** includes all Savvy features plus Apple Event support for all subclasses of TEventHandler with extensive view support. Apple Event support for text includes text attributes and sub-range specification. Recordability supports additional actions, and coercion includes additional types. Additional client and server Apple Events. \$450

**Savvy 1.1** OSA support includes attachability, recordability, scriptability, coercion, in addition to script execution, idling and i/o. Apple Event support includes complex object specifiers, synchronous/asynchronous Apple Event

handling, and Apple Event transactions for clients and servers. The Core Suite of Apple Event objects is supported including the application, documents, windows, and files. Documentation includes technology overview, cookbook, and sample code. \$250 Savvy now supports MPW 3.1, 3.11 and continues to support 3.01, as well as supporting Metrowerks CodeWarrior. **This month only, special offer** – All Savvy versions include free copy of Savvy QuickTime!

**Savvy QuickTime** Requires Savvy, More Savvy, or Super Savvy. Includes QuickTime, Apple Event, and view template support. Movies come out of the box ready to play, edit, and react to Apple Events. They can be included in any view structure, including templates, and are displayed in the scrap view. Movie controls include volume, play rate, looping mode, display style, and other characteristics. \$250

**Super Savvy** includes all More Savvy features plus compile, edit, and record scripts using built in script editor. View template editors, like Ad Lib, can attach scripts to view objects and modified scripts are saved with the document. Script action behavior allow quick access for executing and editing scripts attached to views. Text to object specifier coercion plus more. \$700

## MISCELLANEOUS

**BASIC for the Newton** is BASIC for the Newton! From NS BASIC Corp-oration, it is a fully interactive implementation of the BASIC programming language. It runs entirely on the Newton – no host is required. It includes a full set of functions and data types, hand-written input, windows, buttons and extensions to take advantage of the Newton environment. Applications can create files or access the built-in soups. Applications can also access the serial port for input and output. Work directly on the Newton, or through a connected Mac/PC and keyboard. NS BASIC includes a 240 page pocket sized manual. Runs on all Newton 1.x and 2.0 units. \$99

**Inside CodeWarrior 7 & Inside PowerPlant:** See page 101

**Guide Composer™** gives anyone the ability to create powerful Apple Guide help systems for any new or existing Macintosh application. Great for commercial developers, shareware developers, in-house developers, and consultants, Guide Composer provides a WYSIWYG development environment: Guide content is developed in Guide windows. Design topics, phrases, and panels in the same format as the user will use them. Features are WYSIWYG interface, Topics, phrases, and hierarchical phrases, Coach marks, Fully-Integrated with Apple's Guide Maker (distributed with Guide Composer), compiles scripts automatically, PICLs in Panels, Generated Guide scripts are modifiable, Compiled files are 100% Apple Guide-compatible and royalty-free. Easy-to-use. \$99

**MachTen** UNIX for Macintosh and Power Macintosh MachTen is a Berkeley UNIX that runs on the Classic to the Power Mac, including PowerBooks and Duos! So, in addition to all of the Macintosh applications, you get a Mach-based UNIX with preemptive multi-tasking. MachTen extends the Macintosh operating system with UNIX networking and software development tools. The Macintosh/UNIX integration is so strong that you can even use Macintosh programs and utilities on UNIX data, and UNIX programs and utilities on Macintosh files. Full internet protocol support ensures fast, easy client and server NFS, e-mail, and file transfer between the Macintosh and all TCP-based entities on your network. Built-in internet services include domain name service, POP mail service, internet routing, SLIP & PPP, and Web service. Full X11R5 support with Motif for developing X applications and a high performance X server for using your Mac as an X terminal. MachTen – Power UNIX \$695. Personal MachTen (for 68K Macs) \$495. Professional MachTen (for 68K Macs) \$695. MachTen X Window Software \$350.

**Roaster DR1™** See page 100

<b>Geekware</b> by Metrowerks	
Mousepad	\$8.95
Geekware Hawaiian Classic	\$7.95
Blood, Sweat & Code Black	
Long Sleeve Shirt	\$14.95
Cross Platform White	
Short Sleeve Shirt	\$14.95

# ADVERTISER/ PRODUCT LIST

## LIST OF ADVERTISERS

A. D. Software	70
Abssoft	88
Accusoft	16
Acme Technologies	50
Addison-Wesley Publishing Co.	18, 19
Adianta Inc.	68
ADIInstruments	93
Adobe Developers Association	94
Aladdin Knowledge Systems Ltd.	5
Aladdin Systems, Inc.	86
APDA, Apple Computer, Inc.	29
Apple Developer University	92
Ariel Publishing	95
Bare Bones Software, Inc.	38, 39
Best Enterprises	56
BroadCast Software Corp.	74, 75
Celestin Company, Inc.	87
Creative Solutions, Inc.	48
DataPak Software Inc.	79
Developer Central Macworld	24
dTF Americas, Inc.	35
Eagle Data Protection	69
Emerson Kennedy	36
Engage Communication, Inc.	27
EveryWare Development Corp.	52, 53, 54
Excel Software	43
FGM, Inc.	73
Full Moon Software	92
General Knowledge	76
guideWorks, LLC	68
Iconix	45
International Datawares, Inc.	93
Jasik Designs	37
JointSolutions Marketing	28
JYACC	IBC
Kaleida Labs	22
Language Systems (Fortner Research, LLC)	72
Late Night Software Ltd.	94
MacHack '96 Conference	92
MacTech CD-ROM™, Vol. 1-10	31
MacTech Mail Order Store	97
MacTech Web™ Site	49
MacXperts	96
Main Event	59, 80
Mainstay	13
Mango Tree Software, Inc.	50
Mathemaesthetics, Inc.	1
MetroWerks	BC
Micro Macro	9
Microsoft	15, 66
MindVision Software	33, 41, 96
Motorola	IFC
MultiQuest Corporation	69
Neologic Systems	20
Nisus Software, Inc.	70
Onyx Technology	87
Options Computer Consulting	40
PACE Anti-Piracy	88
Pictorius	17
PowerLabs	44
Quasar Knowledge Systems, Inc.	6
Rainbow Technologies	23
Ray Sauers Associates	85
Richey Software Training	94
Ruskin Group, Inc.	92
Scientific Placement	96
Scapine Software, Inc.	95
State of the Art	84
StepUp Software	82
Stone Tablet Publishing	83
Summit Software Company	30
Supersoft	78
Swift Consulting, Inc.	91
The SU5™ Group, Inc.	32
Symantec	11
Tenon Intersystems	57
The Trattner Network	96
United Software Exchange	96
Water's Edge Software	76
WebEdge	61
WebGenesis	65
Westwood Studios	97

## LIST OF PRODUCTS

<b>Apple Guide</b> • guideWorks, LLC	68
<b>Apprentice 4</b> • Celestin Company, Inc.	87
<b>BasicScript™</b> •	
Summit Software Company	30
<b>BBEdit</b> • Bare Bones Software, Inc.	38, 39
<b>BroadCast™</b> • BroadCast Software Corp.	75
<b>C/C+SDK</b> • Motorola	IFC
<b>CodeWarrior™</b> • Metrowerks	BC
<b>Commercial Software Distribution</b> •	
United Software Exchange	96
<b>DataScript™</b> • General Knowledge	76
<b>The Debugger V2</b> • Jasik Designs	37
<b>Developer VISE</b> • MindVision Software	41
<b>DragInstall® 2.0</b> • Ray Sauers Associates	85
<b>dTF, The Relational Database System</b> •	
dTF Americas, Inc.	35
<b>Duplication Service</b> •	
International Datawares, Inc.	93
<b>ExpressRouter</b> •	
Engage Communication, Inc.	27
<b>File eXPress</b> • Ruskin Group, Inc.	92
<b>FingerToys</b> • Acme Technologies	50
<b>FlexWare® Accounting</b> • State of the Art	84
<b>Fortran SDK</b> • Motorola	IFC
<b>Fortran 77 for Macintosh</b> • Abssoft	88
<b>4D Tool Kit</b> • Options Computer Consulting	40
<b>Genesis Registration, Surveys, &amp; Jive</b> •	
WebGenesis	65
<b>Guide Composer</b> • StepUp Software	82
<b>ICONIX PowerTools™</b> • Iconix	45
<b>JAM®</b> • JYACC	IBC
<b>LS Object Pascal V1.0</b> • Language Systems	72
<b>MacAnalyst</b> • Excel Software	43
<b>MacApp Programmers</b> • MacXperts	96
<b>MACclock</b> • Eagle Data Protection	69
<b>MacDesigner</b> • Excel Software	43
<b>MacEncrypt</b> • PACE Anti-Piracy	88
<b>MacForth Plus</b> • Creative Solutions, Inc.	48
<b>MacHack '96</b> • MacHack Conference	92
<b>MacHASP</b> • Aladdin Knowledge Systems Ltd.	5
<b>MachTen</b> • Tenon Intersystems	57
<b>Macintosh Software Development</b> •	
The SU5™ Group, Inc.	32
<b>MacNosey</b> • Jasik Designs	37
<b>MacRegistry™</b> • Scientific Placement	96
<b>The Memory Mine™</b> • Adianta Inc.	68
<b>MENUMILL</b> • Ariel Publishing, Inc.	95
<b>MicroGuard Plus™</b> • Micro Macro	9
<b>neoAccess™</b> • Neologic Systems	20
<b>neoShare™</b> • Neologic Systems	20
<b>OOFile™</b> • A.D. Software	70
<b>OpenDialog™</b> • FGM, Inc.	73
<b>PAIGE</b> • DataPak Software, Inc.	79
<b>PatchWorks Pro™</b> • BroadCast Software Corp.	74
<b>Power MacForth</b> • Creative Solutions, Inc.	48
<b>PowerPC™ Development Tools</b> •	
APDA, Apple Computer, Inc.	29
<b>PowerTap™</b> • Emerson Kennedy	36
<b>Programmer Training Courses</b> •	
Apple Developer University	92
<b>Programmer Training Courses</b> •	
Richey Software Training	94
<b>Prograph classic™</b> • Pictorius	17
<b>Prograph cpx™</b> • Pictorius	17
<b>Prograph perigrine®</b> • Pictorius	17
<b>Publications</b> •	
Addison-Wesley Publishing Co.	18, 19
<b>QC</b> • Onyx Technology	87
<b>QUED/M™ 2.7</b> • Nisus Software, Inc.	70
<b>Recruitment</b> • MacXperts	96
<b>Recruitment</b> • Mindvision Software	96
<b>Recruitment</b> • Scientific Placement	96
<b>Recruitment</b> • The Trattner Network	96
<b>Recruitment</b> • Westwood Studios	97
<b>Resorcerer® 1.2</b> • Mathemaesthetics, Inc.	1
<b>S-CASE™</b> • MultiQuest Corporation	69
<b>Scripter®</b> • Main Event	59, 80
<b>Script Debugger</b> • Late Night Software Ltd.	94
<b>ScriptWizard</b> • Full Moon Software	92
<b>ScriptX™</b> • Kaleida Labs	22
<b>Sentinel</b> • Rainbow Technologies	23
<b>SmalltalkAgents®</b> •	
Quasar Knowledge Systems, Inc.	6
<b>SoftPolish</b> • Bare Bones Software, Inc.	38, 39
<b>Software Consulting</b> • Swift Consulting	91
<b>Software Development &amp; Testing</b> •	
PowerLabs	44
<b>Software Development Kits</b> •	
Adobe Developers Association	92
<b>Stone Table</b> • Stone Tablet Publishing	83
<b>StuffIt InstallerMaker</b> • Aladdin Systems, Inc.	86
<b>SuperPlot™</b> • Supersoft	78
<b>Symantec C++</b> • Symantec	11
<b>Tango</b> • Everyware Development Corp.	52, 53, 54
<b>TCP/IP Scripting Addition</b> •	
Mango Tree Software, Inc.	50
<b>TestTrack™</b> • Seapine Software, Inc.	95
<b>TMON</b> • Mindvision Software	33
<b>ToolPlus™ 2.6</b> • Water's Edge Software	76
<b>Trade Show</b> • Developer Central Macworld	24
<b>Trade Show</b> • WebEdge	61
<b>The Ultimate Mac &amp; PowerMac Imaging Toolkit</b> • Accusoft	16
<b>UpdateMaker 2™</b> • ADInstruments	93
<b>VIP-C™</b> • Mainstay	13
<b>Visual C++ Cross-Development Edition</b> •	
for Macintosh	15
<b>World Wide Web Pages Creative</b> •	
JointSolutions Marketing	28
<b>World Wide WebWeaver for Macintosh</b> •	
Best Enterprises	56

By Steve Sisak, Contributing Editor

**TIP OF THE MONTH**

Here is a handy function for making sure that an undeletable "file from hell" doesn't get in the way during program execution, just move it to the Trash. This only works when the file is on the same volume as the Trash, however.

Greg Poole

File: FSpTrashFile.h

FSpTrashFile.h

history:  
modified: xx/xx/xx who are you? what did you do?  
created: 11/23/94 greg poole

Greg Poole  
Vital Images, Inc.  
email: greg@vitalimages.com

```
#pragma once

#ifndef __cplusplus
extern "C" {
#endif
    extern OSErr FSpTrashFile( FSSpecPtr file );
#endif __cplusplus
}
#endif
```

File: FSpTrashFile.c

Move a file to the trash if it is not possible to delete it.  
Can only move file to the trash if it is on the same volume  
as the file to be deleted.

```
#include <Folders.h>
#include "FSpTrashFile.h"

OSErr FSpTrashFile( FSSpecPtr theFile )
{
    OSErr theErr = noErr;
    short vRefNum;
    long dirID;
    FSSpec spec;
    FSSpecPtr theTrash = &spec;

    // don't go any further if there isn't a file to deal with or if the
    // file was deleted successfully
    //
    theErr = FSpDelete( theFile );
    if ( theErr == fnfErr || theErr == noErr )
        return noErr;
```

```
// if we got this far, we had a problem deleting the file,
// don't worry, relax and just trash it
theErr = FindFolder( kOnSystemDisk, kTrashFolderType,
    kDontCreateFolder, &vRefNum, &dirID );

if ( theErr == noErr )
    theErr = FSMakeFSSpec( vRefNum, dirID, "\p", theTrash );

if ( theErr == noErr )
    if ( theFile->vRefNum != theTrash->vRefNum )
        theErr = diffVolErr;

if ( theErr == noErr )
    theErr = CatMove( theFile->vRefNum, theFile->partID,
        theFile->name, theTrash->partID, theTrash->name );

return theErr;
```

} // end FSpTrashFile

```
// define TEST_TRASH_FILE for a standalone test
#define TEST_TRASH_FILE
```

```
#if defined( TEST_TRASH_FILE )
```

```
// local function prototypes
static void InitTheMac( void );
static Boolean GetAFile( FSSpecPtr file );

static void initTheMac( void )
{
```

Continued on page 95

**S**end us your tips or we'll install EvenBetterBusError

on your machine! On the other hand, we might just

pay you \$25 for each tip we use, or \$50 for Tip of the

Month. You can take your award in goods,

subscriptions or US\$. Make sure any code compiles,

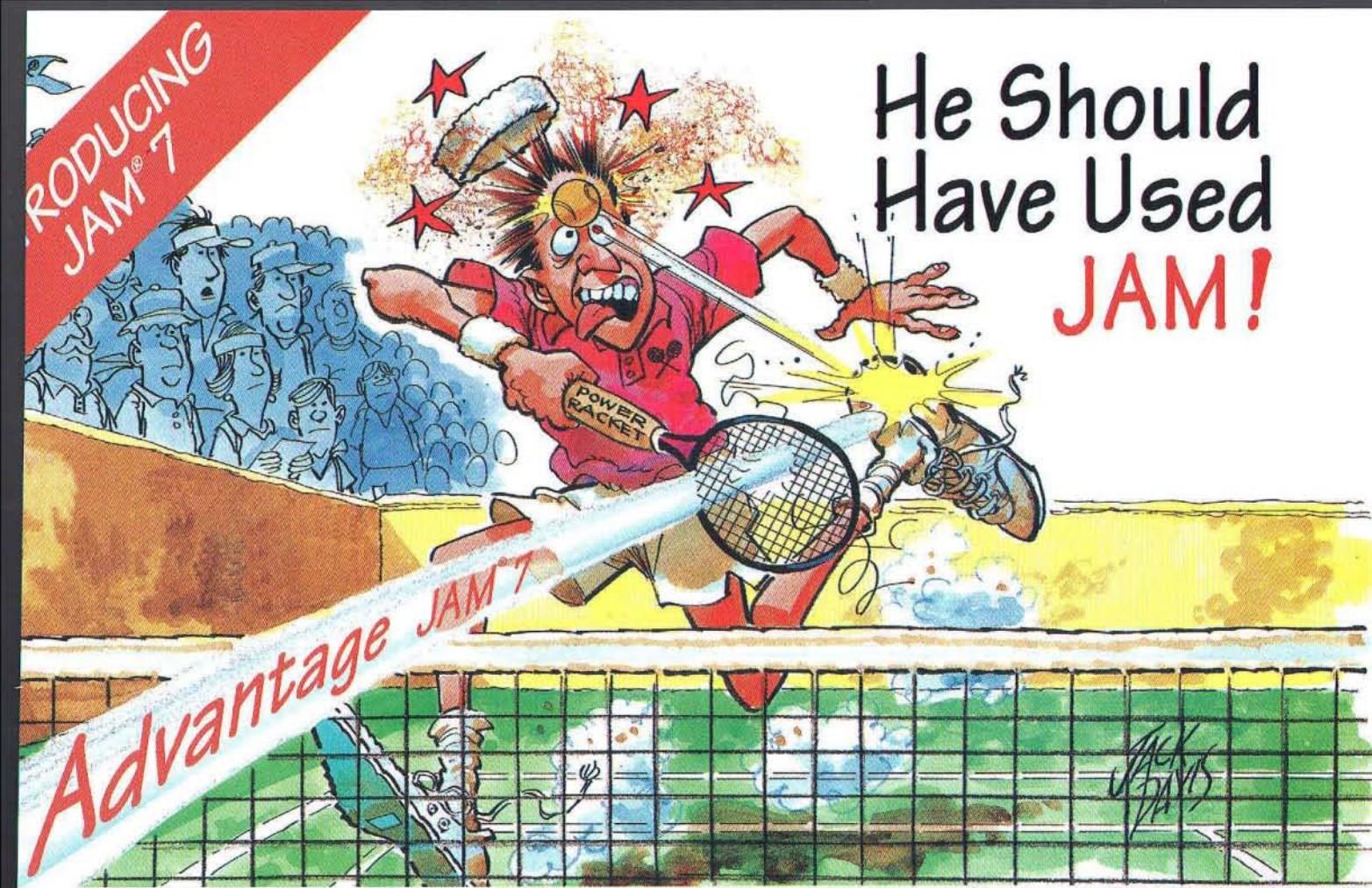
and send tips (and where to mail your winnings) to

our new **Tips e-mail address** at tips@mactech.com.

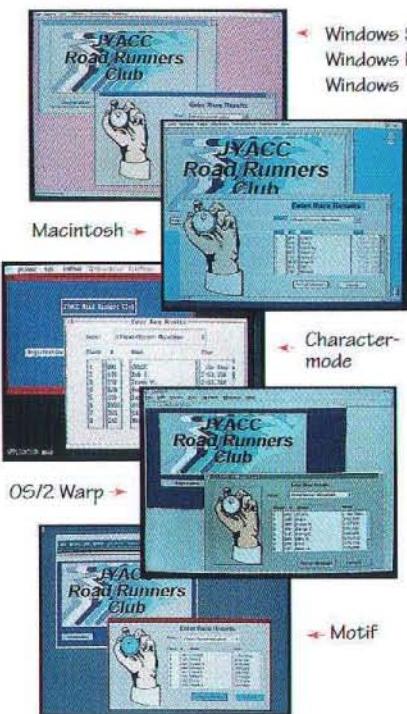
See page two for our other addresses.

PRODUCING  
JAM® 7

# He Should Have Used JAM!



## Building Client/Server Applications Doesn't Have to be Painful. Get JAM® 7 - a Smashing New Version!



Whether you are a business analyst or a top-seeded developer - **JAM 7** makes it easy to develop and deploy industrial-strength applications. The newest release of JYACC's industry-leading second generation client/server tool gives you the features and flexibility you need to see complex projects successfully through from start to finish. **JAM 7** allows you to build client/server applications on the Macintosh and deploy them across platforms including OS/2 Warp, Motif, Windows 3.1, Windows 95, VAXVMS, and virtually every implementation of UNIX. And unlike the competition's runtime-only Mac ports, **JAM** for the Macintosh provides a full application development environment with true Mac look and feel. So don't bear the pain of inadequate tools - get **JAM** and be a winner!

### JAM gets your Macintosh applications up and running with:

- ✓ Native Mode on Both 68K and Power Macintosh
- ✓ True Mac Look and Feel
- ✓ Portability to Windows 95, Motif, OS/2 Warp, and Character-mode
- ✓ Repository Driven Development
- ✓ Access and Native Support for Oracle, Sybase, ODBC and more.
- ✓ Visual Object-based Development Environment
- ✓ Database Screen Wizard with Full Transaction Control
- ✓ Automatic SQL Generation

Call 1-800-458-3313

or E-mail: [macjam@jyacc.com](mailto:macjam@jyacc.com) for a free demonstration kit. For international inquiries call: 1-212-267-7722 or FAX 1-212-608-6753. Visit our Web site at <http://www.jyacc.com>.

BRAZIL (55) 11 816 6220 • DENMARK (45) 33 32 55 77 • FINLAND (358) 0 162 966 • FRANCE (33) 1 46 92 45 44 • GERMANY (49) 40 79 70 07 0 • HRVATSKA (385) 1 242 116 • INDIA (91) 22 283 1188 • ISRAEL (972) 3 921 8320 • ITALY (39) 2 25 52 65 2 • MEXICO (52) 5 550 4500 • RUSSIA (7) 095 288 1924  
SAUDI ARABIA (9662) 671 8749 • SINGAPORE (65) 220 8322 • SLOVENIA (386) 61 1405 004 • SPAIN (34) 1 804 0625 • SWEDEN (46) 8 96 10 10  
SWITZERLAND (41) 21 991 9041 • THAILAND (66) 2 513 3559 • THE NETHERLANDS (31) 70 320 9214 • UNITED KINGDOM (44) 171 814 6660

JAM is a registered trademark of JYACC, Inc. Other trademarks are the property of their respective owners.

MW ★★★★



J Y A C C

Meeting the needs of professional  
developers for over 16 years

# CODEWARRIOR

68K AND POWER MACINTOSH™, MAGIC CAP™, WINDOWS 95™ AND WINDOWS NT™/X32

# THE MOST VERSATILE PROGRAMMING ENVIRONMENT IN THE WORLD

GOLD \$399 STARTER KIT \$79  
BRONZE \$149 INSIDE POWERPLANT \$34.95  
INSIDE CODEWARRIOR \$34.95



## CodeWarrior™



Metrowerks, the Metrowerks logo, PowerPlant and CodeWarrior are registered trademarks of Metrowerks Inc.  
All other companies and products are trademarks of their respective holdings and are hereby recognized.



1994 SOFTWARE  
PRODUCT  
OF THE YEAR

To order contact Metrowerks:

voice: (512) 305-0400 fax: (512) 305-0440 e-mail: sales@metrowerks.com

World Wide Web: <http://www.metrowerks.com>